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Herbert Strang's
Library

CURIOSITIES OF NATURAL HISTORY

BY
Frank Buckland

LONDON
HENRY FROWDE
HODDER & STOUGHTON



*The books in this Library are carefully edited for school
and home reading.*

INTRODUCTION

VISITORS at the house of Dr. Buckland, Canon of Christ Church, must have been astonished, amused, perhaps shocked, according to their temperaments, at the strange things they saw there. In the dining-room there were cages of snakes and green frogs; they might have seen guinea-pigs sporting on the table, or beheld a pony trotting round with three merry children on its back, out of the glass door into the garden, where the youngsters had a regular menagerie of beasts. Such scenes were unusual in the household of a high dignitary of the church, and the license enjoyed by Dr. Buckland's children was, no doubt, a cause of much head-shaking and severe comment on the part of the staid members of Oxford society.

Dr. Buckland, afterwards Dean of Westminster, was a genial, witty, eloquent man, a devoted lover of science, and a notable exponent of the young science of geology. His son, Francis Trevelyan Buckland, universally known as Frank, was born at Oxford on December 17, 1826. Even in babyhood he showed an astonishing interest in natural history. At the age of three he could identify every bird and beast in a large book of coloured plates, and before he could speak plainly he knew the scientific names of all sorts of rocks and fossils in his father's collection. Dr. Buckland encouraged the child's tastes; once, returning from an important meeting in London, he fished out of his pocket a live tortoise, which he presented to the delighted boy. He allowed him to make collections of his own, and Mrs. Buckland, a clever and sensible woman, made no fuss about the inconveniences that must certainly have resulted from the overrunning of the house by animals wild and tame.

From a private school Frank went to Winchester. He is described as a good-tempered, red-headed scrub of a boy, who always had a mouse up his sleeve or in

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his cupboard, spent all his spare time in the hedgerows or the ditches hunting for specimens, and was withal of a generous, happy disposition that made him the most popular boy in the school. He set up in his bedroom a little museum, which was often exhibited as a curiosity to visitors. It was the same when he was an undergraduate at Oxford. His room was a menagerie, and it is told that on one occasion when his tame bear had been more than usually troublesome, the master of the college said to him severely, "Mr. Buckland, either you or your bear must go down."

On leaving Oxford he became a medical student in London, and after a successful course was attached, in 1854, to the 2nd Life Guards as assistant surgeon. He soon began to write articles for the *Field* and other journals, in which he related pleasantly and with humour incidents of his expeditions in search of curiosities, and described the habits of animals as he had himself observed them. After a time he became especially interested in salmon, and when, in his thirty-second year, he was appointed inspector of salmon fisheries, he entered upon a vocation which exactly suited his tastes, and gave him intense pleasure. He died on December 19, 1880.

The present volume consists of a selection from the volumes in which Buckland collected his contributions to magazines. They show very clearly the character of the man: his eager curiosity, his close observation, his kind-heartedness, his keen sense of fun, and the extraordinary extent and variety of his knowledge. He knew so much, and was so ready to impart what he knew, that he often forgets the subject on which he has begun to write, and wanders off in all directions. That which strikes the reader most of all, perhaps, is his strong love of animals. He regarded them not as scientific objects, but as living sentient creatures, worthy of loving and sympathetic study. To them, as to all mankind, he was a friend.

HERBERT STRANG.

Curiosities of Natural History

A HUNT IN A HORSE-POND

PRAY what is there to be found in a horse-pond except mud, dead dogs and cats, and duck-weed ? the reader may ask.—Pray what is to be found in that trumpery ball they call the earth ? the “ Man in the Moon ” may demand of his neighbour Saturn as they both come out for their evening stroll. The answer to such questions is, simply, “ *Life ;* ” Life in all diversity of form, beautifully and wonderfully arranged, each individual deriving benefit from the well-being of the mass ; the mass itself prospering in ratio with the individual.

To the inhabitants of the pond, the pond is the world ; to the inhabitants of the world, the world, as compared to space, is but a pond ; and when the adventurous lizard has made a voyage of discovery round his pond, he has as much right, comparatively speaking, to boast of his performance to his fellow-lizards, as Captain Cook had, when he first sailed round the world, to write two thick volumes for the information of his fellow-men.

Well, let us have a look at the pond-world ; choose a dry place at the side, and fix our eyes steadily upon the dirty water : what shall we see ? Nothing at first ; but wait a minute or two ; a little round black nob appears in the middle ; gradually it rises higher and higher, till at last you

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can make out a frog's head, with his great eyes staring hard at you, like the eyes of the frog in the woodcut facing *Æsop's* fable of the frog and the bull; not a bit of his body do you see, he is much too cunning for that, he does not know who or what you are; you may be a heron, his mortal enemy, for aught he knows. You move your arm, he thinks it is the heron's bill coming; down he goes again, and you see him not; a few seconds, he regains courage and reappears, having probably communicated the intelligence to the other frogs; for many big heads and many big eyes appear, in all parts of the pond, looking like so many Hippopotami on a small scale. Soon a conversational "Wurk, wurk, wurk," begins; you don't understand it; luckily, perhaps, as from the swelling in their throats it is evident that the colony is outraged by the intrusion, and the remarks passing are not complimentary to the intruder.

These frogs are all respectable, grown-up, well-to-do frogs, and they have in this pond duly deposited their spawn, and then, hard-hearted creatures! left it to its fate; it has, however, taken care of itself, and is now hatched, at least that part of it which has escaped the hands of the gipsies, who not unfrequently prescribe baths of this natural jelly for rheumatism.

In the shallow water close by is a dark black spot, that looks like a bit of old hat thrown away to rot.¹ Touch it with the end of a stick—the

¹ Some beavers were one day building their dam across a river, when an old hat came floating down the stream and lodged against their dam; the beavers collected round it and examined

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mass immediately becomes alive. Presto ! thousands of little black long-tailed rascals seem immediately to start into life : these are embryo frogs, alias tadpoles, alias porwiggles, alias loggerheads, alias toe-biters. This last significant title has been given them by the amphibious boys of Clapham Common, whose toes they bite, when fishing about for fresh-water curiosities in the numerous ponds of that district. These little creatures are evidently selfish like other animals in the creation, for they are pushing, squeezing, and hustling each other, like people going to hear Jenny Lind.¹ And pray what are they all so anxious to get at ?—simply a dead kitten. And why should they not fight for good places ? The dead kitten is to them what a turtle dinner is to the City folks ; each duly appreciated by the rightful consumers.

But supposing there happens to be no dead kitten or decayed vegetable matter in their pond, what will the poor things get to eat ? Why, then they will do what the New Zealanders have done before them ; they, the New Zealanders, ate up every specimen of the *Dinornis* ² they could find on their island, and then they set to work and ate up each other ; so do the tadpoles. You ask a proof : last year, I went, with a tin quart-pot in my hand,

it ; at last one of them applied his nose to it and exclaimed, "Alas ! our grandfather." This happened in the days when beavers were killed and their skins made into hats. The grandfather had returned to his colony in the form of a hat.

¹ A famous Swedish singer who had great success in London from 1847 to 1870.

² A huge running bird, otherwise called the Moa.

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toe-biter hunting, on Clapham Common, and brought home exactly a quart of tadpoles; these I emptied into a tub in the beer-cellar; there they lived, being fed on meat several days, till one evening, on sending for a glass of the all-refreshing fluid, up comes John with half a smile on his face, and simpers out, "If you please, sir, I have brought the beer, but I have upset the tadpoles." On arriving at the scene of the disaster, there were the poor things high and dry on the floor. I restored them to their tub, but forgot to put back their meat. The next morning, I found some had not recovered their accident, and round the bodies of their departed brethren were crowded the cannibal survivors, eating and pulling away, each for himself. After this, I left them much to themselves, and their numbers diminished considerably; the cook's opinion being, as usual, that that omnivorous creature, "*the cat*," had a hand in it; bringing forward as an argument, which is not strictly zoological, as applied to tadpoles, that the "cat is fond of fish."

By the discovery of skeletons, murders are often brought to light; so it was in the case of Tadpole v. Cat; the skeletons of the murdered froglings I found in abundance at the bottom of their tub: and wonderful skeletons they were, the form of the little creatures being beautifully shown in a framework of delicate gristle, the various parts still united together, but separating on the slightest touch. I have sometimes seen capital skeletons of small animals in ponds, the flesh having been eaten away by tadpoles. In the United Service

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Museum are some very perfect skeletons of sea-birds made somewhat in the same way; they were brought home from the Arctic regions, and were made by the sea-lice; the birds were let down into the sea to an immense depth, and left there twenty-four hours; these bones are as white as ivory.

Common shrimps are capital skeleton-makers: these little creatures are wonderful scavengers, and eat up the vegetable and animal refuse of the ocean. Behind the ancient fort at Tilbury, opposite Gravesend, is a considerable extent of flat ground, intersected by deep ditches. In these ditches I found swarms of shrimps feeding on the weed along the banks: though I could see them plain enough, I found it very difficult to catch them; for the moment my hand-net touched the surface of the water they vanished—shooting away like little meteors; and even when I did get them in the net they hopped out like gigantic fleas. I discovered a small sluice-gate, through which a shallow stream of water was running: looking over very quietly, I saw thousands of these little shrimps, all with their heads pointed up stream, feeding upon what they could find. Presently a crab, about three inches and a half long, appeared at the top of the water, then another, and then another: and these perpetually caught with their claws at passing portions of what they saw floating by; when they had got anything they sank with it, probably to devour it.

Till then I never quite understood the use of a crab's claws; though clumsy-looking things, the crab can wield them with great activity and

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neatness, and they seldom missed what they clutched at. The boys, taking advantage of this, drop into the stream a common bit of string, the crab seizes hold and goes to the bottom to examine his prize; but before he has time to ascertain that it is not edible, and to let go, the boy whips him up on to the land.

Over the place where the shrimps were feeding I observed masses of a white-looking substance floating: I got them up, and they turned out to be the shed skins of the shrimps; for shrimps shed their skins as well as lobsters. From examination, I should conclude that the shrimp emerges from his old skin at the junction of the tail with the body; he sheds even the skin of his antennæ or feelers, as well as of the peculiar saw-like weapon which projects between his eyes. When lobsters shed their outer skins, strange to say, they shed also the lining membrane of their stomachs. I could not find any of the lining membrane of the stomach among the shrimp skins. They were for the most part much broken up; but I picked out two or three good specimens, which are now in the College of Surgeons.

My friend, Mr. Roberts of Worthing, has informed me that both lobsters and prawns have the most acute sense of smell. Nine miles out at sea, off Lyme Regis in Dorsetshire, is a ledge of chalk rocks abounding with these animals. If a basket be let down, the prawns directly crowd together around it: if it be daylight, and they can see the boat, they will not go in, but at night they go in in great numbers. Mr. Roberts says a lobster will

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smell a putrid object a hundred yards off. A crab is caught with fresh bait only. When at Weymouth, many years ago, with my father, I recollect his telling me a story of a large ship being wrecked off the Isle of Portland, and that many persons were drowned. Soon after the wreck, a great number of lobsters and prawns were caught, and none of the Weymouth folks would eat them, because they were supposed to have fed on the bodies of the drowned people, and this was very possibly the case. The lobsters were therefore sent off to London, for the benefit of those who did not know their history.

It is extraordinary how soon animals and birds find out the place where there is anything to eat (we may include our own species among the animals). The regiment to which I belong very frequently marches down to Wormwood Scrubs, for field-days. Upon arriving at the Scrubs, I have not seen a single rook; but the rooks very soon appear: they come to pick up the bits of bread which drop out of the paper in which the men carry their refreshment. The rooks always go to the place where the regiment has dismounted, as there they find most to eat. These rooks come I believe from the trees in Holland Park—they certainly often arrive from that direction.

The habit of eating each other among the tadpoles may by some be considered horrible and unnatural; but when we consider the thousands that are hatched from the egg, its beneficial use in the economy of nature will at once be perceived. Were all the young tadpoles to become frogs, not

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only would mankind be cursed with a plague of Egypt, but the frogs themselves would suffer, inasmuch as there could not possibly be food for all, and starvation would be the consequence. Thus, by inquiry into the ways of an all-wise and munificent Creator, we may generally find that what at first sight seems cruel, is in reality merciful and kind.

Come again to the horse-pond a few weeks after the tadpole era, and you will find hundreds of lively little frogs, no longer black specks, but having lost their gills, and their tails, and their dead-kitten appetites, sent forth to fight their way in the world; or may-be, not in the world, but in the regions of the air above the world, thence suddenly to descend, to the astonishment of rustics, and to the delight of those profound philosophers, newspaper naturalists.

I will not enter into the various changes assumed by the tadpole before it becomes a frog: this transformation has been ably described elsewhere. Those who wish to see with their own eyes what happens have only to go to the College of Surgeons, where they will find a series of models, of gigantic size compared to the originals, illustrating this point.

It may not here be out of place to give the interpretation of frog showers, as now most generally received by competent judges. The actual fact, that considerable spaces of ground have been suddenly covered with numerous small frogs, where there were no frogs before, has been proved beyond a doubt. Some have called in

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the aid of waterspouts, whirlwinds, and similar causes, to account for their elevation into the regions of air, and some have even thought that they were formed in the clouds, from whence they were precipitated. It has generally been in August, and often after a season of drought, that these hordes of frogs have made their appearance; but, with Mrs. Siddons,¹ we will exclaim, "How gat they there?" Simply as follows: the animals had been hatched, and quitted their tadpole state and their pond at the same time, days before they became visible to, or rather observed by, mortal eyes. Finding it unpleasant in the hot, parched fields, and also running a great chance of being then and there dried up by the heat of the sun, they wisely retreated to the coolest and dampest places they could find, namely, under clods and stones, where, on account of their dusky colour, they escaped notice. Down comes the rain, out come the frogs, pleased with the chance. Forthwith appears an article in the county paper; the good folks flock to see the phenomenon. There are the frogs hopping about; the visitors remember the shower, and a "simple countryman" swears the frogs fell in the shower, and he saw them fall: frogs, visitors, countrymen, editors, are all pleased, and nobody undeceives them, nor are they willing to be undeceived.

The skin of frogs readily absorbs water, and in hot weather they always retreat to places where they will find moisture, or at least a certain degree of

¹ A famous actress (1755-1831). Her manner in conversation was very formal and impressive.

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dampness : if you want to catch a frog on a hot day, you must look under boards, clumps of grass, etc., and you will probably find him at home. After a continuance of hot weather, frogs are frequently found dead and quite dried up, particularly on or near dusty roads : they have probably come out of their damp hiding-places, and the moisture of their bodies having been evaporated before they had time to get back again, they have been dried up like mummies. When water is scarce, frogs collect together to keep each other moist. Water can become scarce from frost as well as from heat ; and this was curiously exemplified by what once happened at Carlsruhe. The town, during a long frost, became deprived of the usual supply of water for many days. A great number of frogs, to shelter themselves from the frost, took refuge in the hydraulic engines by means of which the houses are supplied with water. The cold increasing, the frogs got up into the pipes, and in many places became agglomerated into a mass so compact, that it was with the greatest difficulty they were cleared out, and a passage for the water made.

There is a curious fact as regards the hybernation or winter sleep of frogs : of course in this state they cannot eat : most other animals, as the bear, marmot, etc., which hybernate, lay up in their bodies a supply of fat during the summer, which becomes absorbed in the winter. According to this rule, a frog ought to be very fat towards the close of summer, yet who ever saw a fat frog ? Still a frog does lay up fat for winter consumption, not outside his body, but inside ; for we find that

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the membrane which surrounds the intestines, the peritoneum, contains remarkable folds, and in these folds a fatty matter of a yellow colour is deposited, and this fat is, with reason, supposed to be stored up there for winter consumption.

Dr. Townson, in his tracts on Natural History, London, 1799, records a series of observations which he made on frogs, and also on some toads : these were directed chiefly to the very absorbent power of the skin of these reptiles, and show that they take in and eject liquids through their skin alone, by a rapid process of absorption and evaporation ; a frog absorbing sometimes in half-an-hour as much as *half* its own weight, and in a few hours *the whole* of its weight of water, and nearly as rapidly giving it off when placed in any position that is warm and removed from moisture. Dr. T. contends that as the frog tribe never drink water, this fluid must be supplied by means of absorption through the skin. Both frogs and toads have a large bladder-like sack, which is often found full of water. "Whatever this fluid may be" (he says), "it is as pure as distilled water, and equally tasteless. This I assert as well of that of the toad, which I have often tasted, as that of frogs." I myself have frequently observed that when a frog is caught, by suddenly ejecting a quantity of water he will diminish his size nearly half. When you first catch him he looks very fat, but in five minutes he looks thin and half-starved ; place him all night in a little water, shallow enough for him to sit comfortably in, and he will have recovered his plumpness by the morning.

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Happening to be in Germany, in 1846, I was desirous of getting some insight into the manners and customs of the inhabitants of the ponds, and after much observation, arrived at the same conclusion concerning them as the master of one of Her Majesty's ships did respecting the subjects of the Imaum of Muscat. Being compelled to record categorically a reply to the inquiry, "What are the manners and customs of the inhabitants?" he wrote, "Manners they have none, and their customs are very beastly." This is much the case with the subjects of King Frog.

My knowledge of their vicinity was based upon auricular confession. Night after night, the most dreadful din of croaking bore testimony to the fact that they were unburdening their consciences; and I determined to try if I could not unburden their bodies of their batrachian souls altogether. However, before I detail my proceedings, I have a word to say with reference to their croaking.

Horace bears expressive testimony to the disgust *he* felt at it, when, after a heavy supper to help him on his way to Brundisium, he exclaimed:—

——— "*Mali culices, ranæque palustres*
Avertunt somnos."¹

So loud and continuous is their song, especially in the breeding season, that I find it recorded—in the former good old times of France, when nobles *were* nobles, and lived in their magnificent chateaux scattered throughout the country—that the peasants were employed during the whole night in

¹ "The fenny frogs, with croaking hoarse and deep,
And gnats loud buzzing drive away our sleep."—*Francis.*

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beating the ponds within earshot of the chateaux with boughs of trees, to prevent the slumbers of the lords and ladies being broken by their paludine neighbours. The frogs can produce this noise under water as well as on land. Ovid alludes to this fact when he says,

“Quamvis sint sub aqua, sub aqua maledicere tentent,
Vox quoque jam rauca est, inflataque colla tumescunt.”¹

In some places, from their making this peculiar noise, they have been called “Dutch nightingales.” In Scotland, too, they have a curious name, Paddock or Puddick; but there is poetical authority for it :—

“The water-snake whom fish and paddocks feed,
With staring scales lies poisoned.”—*Dryden*.

Returning from the University of Giessen, I brought with me about a dozen green tree-frogs, which I had caught in the woods near the town. The Germans call them Laub Frosch, or leaf-frog; they are most difficult things to find, on account of their colour so much resembling the leaves on which they live. I have frequently heard one singing in a small bush, and, though I have searched carefully, have not been able to find him : the only way is to remain quite quiet till he again begins his song. After much ambush-work, at length I collected a dozen frogs and put them in a bottle. I started at night on my homeward journey by the diligence, and I put the bottle containing the frogs into the pocket inside the diligence. My fellow

¹ Although they are under the water, yet they try to curse under the water.

Their voice too is hoarse, and their inflated throats swell.

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passengers were sleepy old smoke-dried Germans: very little conversation took place, and after the first mile, every one settled himself to sleep, and soon all were snoring.

I suddenly awoke with a start, and found all the sleepers had been roused at the same moment. On their sleepy faces were depicted fear and anger. What had woke us all up so suddenly? The morning was just breaking, and my frogs, though in the dark pocket of the coach, had found it out; and, with one accord, all twelve of them had begun their morning song. As if at a given signal, they one and all of them began to croak as loud as ever they could. The noise their united concert made, seemed, in the closed compartment of the coach, quite deafening: well might the Germans look angry; they wanted to throw the frogs, bottle and all, out of the window, but I gave the bottle a good shaking, and made the frogs keep quiet. The Germans all went to sleep again, but I was obliged to remain awake, to shake the frogs when they began to croak. It was lucky that I did so, for they tried to begin their concert again two or three times.

These frogs came safely to Oxford; and the day after their arrival, a stupid housemaid took off the top of the bottle to see what was inside: one of the frogs croaked at that instant, and so frightened her, that she dared not put the cover on again. They all got loose in the garden, where I believe the ducks ate them, for I never heard or saw them again. These frogs cost six shillings each in Covent Garden Market: they are not difficult to keep alive,

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as they will eat black beetles, and these are to be procured at all seasons of the year.

In the green tree and edible frogs there are fissures at the corners of the mouth, for admitting the external protrusion of the bladder-like cheek-pouches which are inflated from the windpipe; and these are the instruments with which they produce their noise. These cheek-pouches they invariably protrude in their struggles to escape when held by the hind legs. Under these circumstances they are also capable of uttering a peculiar shrill cry of distress, differing completely from their ordinary croak.

The female frogs have not these voice sacs—in the males alone we find them. Their use may possibly be to enable one sex to be aware of the presence of the other.

In the centre of a dark pine forest near Giessen in Germany I found a shallow black-looking pond which was full of these noisy frogs. Anxious to catch some specimens, and obtaining a landing-net, I cautiously approached this pond, and then, without allowing my shadow to fall on the water, or making the slightest noise, I peeped through the dense brushwood at the side; yet the moment I showed myself, every individual who happened to be above water, jumped off his perch, and was out of sight in an instant. I tried every means to catch them, but in vain. At last I borrowed from some boys a long tube of wood with a small hole smoothly and equally bored through the centre, which they used to shoot small birds about the hedges. Armed with some arrows made of sharp

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needles tipped with cotton wool, I ensconced myself in a bush, and waited quietly for my prey. In a few moments, the frogs, one by one, began to poke their noses out of the water. I selected the finest, and by dint of a good shot, I succeeded in fixing an arrow in his head. In the course of the afternoon I bagged several of the patriarchs of the pond, some of them as large as the largest English toad. Upon being struck with the arrow, they nearly all protruded their sacculi from each side of the mouth, in the manner above narrated.

Frogs feed principally upon beetles, which they find among the tufts of grass by the sides of the ponds. They do not, I think, grope about among the grass for their prey, but rather wait till the beetles run near them, and then they easily catch them by means of their projectile tongue. I have examined the stomachs of many frogs just caught, and have found both slugs, beetles, and caterpillars. One year, when the wire-worm was proving very destructive to the turnips, I examined some frogs from a field swarming with it; the frogs were quite gorged with the worm, and must have done much good to the farmer. I mentioned the fact to him, and he issued an edict for the preservation of the frogs. In the cages where I have kept frogs, I have frequently found masses of the wing-cases and legs of the beetles and flies they have eaten. These wing-cases, being composed of a horny material called Chitine, are not digested.

I have in my possession a mass of the bones of frogs, mice, and again beetles' wings: which was found in a moat of an old castle (the locality I

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forget). There was a considerable deposition of this peculiar mixture of bones, amounting to many inches in thickness. It was a puzzle for some time, how frogs, mice, and beetle bones came there all mixed together, but the two previous instances will give an explanation. Above the moat must have been an owl's nest, and these birds always spit up the bones of what they eat. Owls live on mice, frogs, and beetles, and hence the deposition of their bones.

Virgil, a good observer of nature, when describing the approach of rain as predicted by animals, mentions the flight of cranes and swallows, the cow looking up to the sky, the pigs, etc., and instances the frogs, especially, as being good barometers:—

“Et veterem in limo ranæ cecinere querelam.”¹

Georg. i. 378.

The green tree-frogs are used to this day in Germany as barometers; they are placed in tall bottles, with little wooden ladders. The steps of the ladder mark as it were the degrees; the frogs always go up towards the top in fine weather, and lower down at the approach of bad weather. I have often seen the Germans consult their frogs when starting on a picnic expedition. Leeches, too, make good barometers. I have two leeches in a long bottle, which generally will indicate what sort of weather is coming in the next twenty-four hours.

But let us return to our horse-pond: we have been sitting there some time, looking at, and

¹ And the frogs have sung their old song in the mud.

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thinking about, the frog family. The sun is very hot, and no horse has come to drink. Like a dandy from his club, decked in his best, the great water-newt, Sir Triton Cristatus (the king of the pond in the absence of the ducks, who are his arch-devourers), rolls lazily forth from his hiding-place. Look at his beautiful coat, and his orange-coloured waistcoat—down the whole length of his back disports a magnificent crest, for just now he is in prime condition. He is indeed a handsome beast, and by the way he parades himself up and down, in front of his favourite batch of weeds, he evidently knows it.

“O formose *Triton*, nimium ne crede colori.”¹

We want you : how are we to get you ? Sir Francis Chantrey was a fisherman, and a practical man. “Never,” said he, “go without a knife, a bit of string, and a sixpence.” We have followed his advice, and have all those three articles in our pocket. When we see the triton, our obedience to sponsorial authority is rewarded. We cut a stick with our knife, we tie a bit of string to the end of it ; now for a hook—ah, here is a pin all ready, in the corner of our coat ; this is soon crooked, and a worm affixed thereto ; Triton sees it, he snaps eagerly, we have him, and for the first time in his life he is tied up in the corner of a pocket-handkerchief.

But where is Lady Triton ? Not far off ; she is recognized by her crestless and russet-coloured body, but she refuses the worm. She shall be

¹ O, beautiful Triton, do not trust too much to your appearance.

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caught, nevertheless, by means of our sixpence. This is quickly changed into fine brass wire at a neighbouring shop, the proprietor of which seems to sell everything, from a nail to a flitch of bacon, or a pair of old woman's pattens. In true hangman style, a noose is made of wire, and fastened to the stick—the captive couple meet again in the pocket-handkerchief. This lizard-fishing must be profitable sport to somebody, for on asking the price of some medium-sized specimens at Covent Garden, in a shop up the stairs, I found they were worth threepence each. Tadpoles also were saleable articles, and cost twopence a dozen, and the water-beetles, that have oars like a waterman, cost from twopence to sixpence each. Of "weed," they could "make any quantity, a pennyworth, or sixpenny-worth,"—so something saleable is to be got even out of a horse-pond.

The newts are stupid things, and do not profit by experience. In a pond, in a brick-yard not far from Hanwell, I caught many beautiful specimens: the worm was fixed on to a good-sized fish-hook in this instance, and it was impossible for the lizard to get the hook into its mouth. I had a good day's sport, although I only *hooked* one; the others I caught by allowing them to bite at the worm; they went at it fiercely like bull-dogs, and held on tight like these animals. I gave my victim plenty of time, and when he had got a firm hold, quickly but cautiously pulled him out of the water. If the line became at all loose the triton escaped. I found that they were caught by their teeth sticking into the worm. One triton actually took the bait seven

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times, and was pulled out of the water thrice before I got him. This shows how very inactive their brains must be, and is another proof, were it wanted, that the intelligence of an animal depends upon the development of its cerebral organ.

I observed that these lizards, when taken hold of, invariably uttered a small shrill cry, something between a squeak and a croak: this cry I have heard frequently uttered by lizards in my vivarium; they generally utter it about sun-down. Frequently also they would turn sharp round and bite, or rather pinch the finger, their small teeth not being strong enough to break the skin. The females are either not so bold or are more cunning (probably the former) than the males; they are much more difficult to catch, and much more wary in their movements. I saw one female have a fight with a gudgeon, who invariably returned to the same clump of weeds, as if looking for something; probably the female laid her eggs in this clump of weeds, and the fish wanted to eat them. The fish seemed afraid of the newt, and always made off when she came near; she charged him vigorously two or three times, and seemed to bite him.

The scene changes: the male and female newts have now resided a week in a private crystal palace of a globular shape. What we observed about them was that they lived like Mr. and Mrs. Spratt and always quarrelled at dinner-time: a worm was given them, the gentleman did not wait for the lady, but seized the one end of the worm while she seized the other, each gulping their portion down as fast as Italians their macaroni; but

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there must be an end to all things, and worms are included in the category. In due time the loving couple meet, nose to nose, each having swallowed exactly half a worm. Husband looks daggers at wife, as much as to say, What business have you here? The compliment is returned, and they begin waltzing, twisting, twirling, and rolling over each other, round and round their globe; neither will drop the worm, neither will cry "pec-cavi;" somebody must give way, and that somebody is the poor worm, who "comes in two in the middle," and settles the conjugal difficulty.

One day I quietly let a worm fall exactly between two large newts that were resting at the bottom of my vivarium; they both turned at it at the same moment, and both made a bite. The worm gave a wriggle just at that moment, and, both newts missing him, caught hold of each other by the fore legs—newt A having the right leg of newt B in his mouth, and newt B the leg of newt A in the same position; they soon found out their mistake, and began writhing and tumbling about over and over, round and round the vivarium, as tightly fixed to each other as a couple of bull-dogs, knocking off the shells from the sides, and frightening the poor water-beetle out of his wits, and causing him to ply his oars vigorously. Both of the combatants at last seemed tired, and opening their mouths, set free the captured legs; they then retired to opposite ends of the tank, thoroughly exhausted.

Secondly. I have observed that the lizards obey the command, "Increase and multiply."

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The young make their *début* in the form of an egg : the female will deposit them when in captivity. These eggs are not agglutinated together in a gelatinous lump as are the frogs' eggs, but are carefully deposited by the mother, one by one, each in a distinct spot from the other. Resting on a leaf or bit of weed, she folds it, by means of her two hinder feet, into the shape of a funnel, and therein deposits a single egg, gluing, at the same time, the folded parts together, thus concealing and protecting the enclosed embryo. In due time the young lizard-tadpole comes forth from his egg, and much resembles, during the few first stages of development, his first-cousin, the frog-tadpole : both are furnished with tufted gills or branchiæ outside their body, which act the part of lungs ; these disappear in time, and are replaced by true lungs inside their body. The eggs are deposited at the latter end of April, and during the months of May and June ; but I know not how soon the tadpole assumes the form of a perfect adult lizard.

Thirdly. I have observed that the lizards frequently change their skins, as do snakes ; and this much in the same manner. A few days before the skin is coming off, the lizard looks covered with a sort of slime, and appears stupid and sluggish. When he feels that his coat is loose enough, he gets between two conveniently-placed portions of stick or weed, and, leaving the dead skin, or slough, as it is sometimes called, behind him, comes forth more brilliant and lively than ever. These cast-off skins are sometimes most perfect, particularly

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when the lizard has not been disturbed during the operation; the only way to examine it is to take it most carefully out from the vessel in which it is found, on the top of a camel's-hair brush¹ (anything ruder, as a bit of stick, will tear it to bits), and place it in a wineglass of clear water, then, with the lightest touch possible, brush the parts asunder, and, if you are lucky and have a light hand, you may get the whole skin expanded quite perfect, looking like the ghost of its former owner. There is not a portion of the body that has not parted with its covering; the very toes and skin of the feet are seen hanging like an empty glove; and even the beautiful and yet hard and transparent covering of the eye remains faithfully fixed in its old companion, the skin. The lizards, why or wherefore I know not, are very fond of eating these cast-off skins. I have frequently seen them at work at it.

Crabs and lobsters, too, change their skins periodically, but how often is not certain. Mr. Quekett lately showed me a crab upon whose back an oyster had taken up its position, and there it was hard and fast. Now by examining the oyster it was evident that its age was about three years; it became, therefore, a self-evident conclusion that the crab had not cast his coat for three years, as an oyster, who has once taken up his position and fixed himself when quite young, can never make a change. Oysters, nevertheless, that have not fixed themselves, but remain loose at the bottom of the

¹ I once told a soldier servant to go and borrow me a camel's-hair brush; he came back and told me that my friend had not got a camel's "hair-brush."

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sea, have the power of locomotion; they open their shells to their fullest extent; and then suddenly contracting them, the expulsion of the water forwards gives a motion backwards. A fisherman at Guernsey told me that he had frequently seen oysters moving in this way.

Passing through Billingsgate-market I saw, in a glass-case in a fishmonger's shop, a lobster, extended full length, of a green colour. I immediately inquired about it. It had been in the case some time, the man told me, and the colour had faded; but when it was alive, the green was of a much more brilliant hue. It came from the coast of Cornwall, and the fishmonger's theory was that when it had cast off its old coat and retired into a hole in the rocks for its new coat to harden, this new coat became impregnated with copper, the chosen retreat being a hole in a rock containing copper. I do not quite agree with his theory, as I have seen the common fresh-water crawfish of a green colour, and they could not have got at any copper. The theory is, however, ingenious; there is no reason why a lobster should not have been green instead of dark blue, its natural colour when unboiled. The cause of a lobster turning bright red when boiled, is a mystery I never yet heard explained. Is it mechanical or is it chemical?

That lobsters have affection for their young is proved from the following facts communicated to my father by Mr. Peach. He states, "This love of offspring is not confined only to the scaly tribe. I have been told by the fishermen of Goran Haven (Cornwall) that they repeatedly see the lobster

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surrounded by its young even until they are six inches in length: this I have had, not from a solitary observer, but from many, at different times, and quite unknown to each other. So large was one taken by a fisherman's boy, that it was put into the 'store-pot' to be sold to the crab-merchant when he came round, but the wicker-work allowed it to escape. The old lobster has been seen lying with its head peeping from under a rock, with its large claws extended, and the young ones playing between them. When danger was near, the old one rattled its claws; the young ones sheltered themselves under the rock, and the old one followed."

Every person who has eaten a lobster salad must know what the so-called berries are like; they are the eggs of the lobster. The kangaroo, as is well known, has a pouch in its abdomen, where it carries its newly-born young; and for this reason they are called marsupial (from *μαρσούπιον*, a pouch): among creatures that live in the water, lobsters and crabs seem to be the representatives of marsupial tribes on land. If the tail of a lobster be stretched out straight, there will be seen on its lower surface a number of flat finger-like projections. In the male creature these are comparatively small and short; in the female they are long and broad: and if it be the right time of year, clusters of eggs will be found adhering to these appendages, so that by simply examining the under surface of the tail, the fishmonger knows a male from a female lobster. This same arrangement prevails in the common fresh-water crawfish, and from a specimen in the

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College of Surgeons, it seems probable that even after the eggs are hatched, the young take shelter under the motherly tail; for No. 3783 is a crawfish, where several little mites of crawfish, just come out of the egg, and not much bigger than the egg, are seen adhering firmly to the finger-like processes. When the mother closes her tail, her offspring will be snugly concealed out of harm's way beneath it. So that even in creatures so low in the scale of creation as lobsters and crawfish, we see that parental affection has been planted by the great Creator of their species, that the race may not become extinct.

Mr. Townsend, fishmonger, in Hungerford Market, tells me that, not unfrequently, lobsters are brought to Billingsgate with their two shells on, the old one in process of peeling off from the new one underneath. He promised to procure me the first specimen he saw, and a few days ago he sent to the College of Surgeons two lobsters in the process of moulting. The shell of the largest has split exactly down the centre of the head portion, so that a slight pull would tear the two parts completely away. The shell in fact comes off in two equal halves, just as does a regimental cuirass from the breast of a Life-guardsman, when loosened from the shoulder-straps and waist-strap. The old shell on the tail of the lobster is simply loose, and not split.

From what I observed in the Tilbury Fort shrimps, it is possible that the tail part is never split, but that the tail slips out of it, like a hand from a glove.

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The second lobster is a very ragged-looking thing: he is casting his shell in a very slovenly manner; it is coming off here and there in patches and bits, which is I believe an exception to the rule.

Though I have never witnessed the casting of the shell in a crab, I have been fortunate enough to find two Dragonflies in the act of coming out of their larva state. Hunting about in the woods, at Weybridge, near London, I came upon a pond, round which were hovering hundreds of the largest species of dragonflies, or, as the French call them, demoiselles; they were foraging about for food, and every now and then made a pounce down upon some unfortunate insect smaller than themselves. Looking about among the rushes at the edge of the pond, I was much pleased to find in nearly every tuft, two or three cast skins of this insect. The first part of his existence the dragonfly passes in the water, in a very different shape to what it afterwards assumes. When it is time that the transformation should take place, the larva crawls out of the water, and on to a stick, bit of rush, or in fact anything that it can catch hold of. Now unless there existed some contrivance for holding firm the skin which is to be cast, it would hang about the body of the fly as it made its exit. Accordingly we find that at the ends of each of the legs of the larva are two curved and sharp-pointed hooks. When its instinct prompts, it places itself in such a position that the hooks shall have a firm hold, and keep the skin destined to be left in an immovable position. The skin then splits at the back, and out comes the perfect fly.

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The larva-cases which I found were most abundant. There was an old post of rotten wood close to the margin of the pond, and this giving a firm hold, was literally covered with cast skins. On one bunch of rushes, I found a dragonfly just half-way out; the head and one of the wings were quite free, but its tail was not as yet liberated. Most carefully did I catch it, wishing to preserve it in the act of transforming; I put it in my hat, but in a few minutes it came quite out of its old skin. A few yards further on from the place where I found the last specimen, I found another dry skin on a tuft of rushes; two of the rushes had been taken hold of by the legs of the opposite sides, and had been pressed together, so that their elasticity, in attempting to resume their natural positions, kept the legs quite tense, and the skin perfectly fixed. A few inches below this cast skin, I found the dragonfly which had just come out: it was resting upon a rush, and its wings were spread out to their fullest extent. The body of the creature was quite soft and moist, and it was evidently exposing itself to the sun, to allow its wings and body to harden before it took its flight. I brought home both the cast skin and the insect (which I killed by holding it over a chloroform bottle), and they are now in a cabinet in the Museum of the College of Surgeons. A few weeks afterwards I again visited this pond; hardly a dragonfly was to be seen, and the cast larva-cases had nearly disappeared.

But to return to the lizards. A magnifying glass will reveal, on the surface of the cast-off skin aforesaid, numerous pits and depressions (remem-

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ber the skin is inverted) : these pits and depressions correspond to their relative elevations and furrows on the body of the lizard. These curious formations are little glands, set in the skin, which secrete a peculiar fluid, and which serve, I think, two purposes—first, to keep the body of the lizard moist when he goes out of the water, which he not unfrequently does, I mean on his own account; secondly, to afford his poor naked body some sort of protection. Who ever saw a dog hold a lizard long in his mouth? Certainly not. The captive exudes a peculiar acrid fluid from these glands, and the dog drops him instant.

The lizard tribe will remain alive a long time under circumstances that would be fatal to most other creatures. Mr. Quekett showed me a lizard called the “horned frog of Texas,” in a little tin box in which holes had been perforated: this was the most hideous creature I ever saw, looking like a five-shilling piece, with a tail on one side, and two horns on the other. It had been sent in its box by post all the way from Carolina, in America. It had started on May 1st, and arrived at the College of Surgeons, London, May 17th, 1857. The box was not big enough for it to turn in, and it must have remained in the same position all this time: it looked very thin, and refused all food. Having frequently had occasion to feed snakes and tortoises when they would not eat, I proposed to Mr. Quekett to feed it; I accordingly, with some difficulty, opened its mouth with a bit of ivory, and having, as it were, gagged it open, I put in three big flies, and then took away the ivory, and the lizard

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swallowed the flies with apparent relish. This lizard, unlike the tritons, has not poison-secreting glands; nor are the Italian land-lizards armed with them, for the Italian cats delight to catch and eat them.

Crocodiles have not glands in their skin which secrete acrid matter. Their skin is exceedingly hard and strong; so strong, indeed, as to be useful even in the shape of armour. In the British Museum there is a suit of armour—from ancient Egypt, I believe—made to fit a man, and composed entirely of crocodile skin. The stuffed crocodiles in museums are of a dark, almost black colour; but I read that when alive, and in their native haunts, the skin is of a greenish hue.

There are many insects and beetles which come out only at night. These are very interesting to the entomologist, who often finds it very difficult to catch the minuter kinds. Toads are therefore turned into beetle-traps, and made to catch these little night insects. A brigade of skirmishing toads is turned loose into the garden in the evening; the toads, unconscious why so much kindness is shown them, do their best to get a good meal, but in the morning their master comes and makes them eject all their night-work, which he does without hurting them; and in this way many curious and rare specimens of minute nocturnal insects have been obtained. I have heard of a capital way to catch night-moths, with little trouble; it was practised by a brave-hearted and gallant artillery-officer, alas! now no more. He lived in a charming country-house near St. George's hill at Weybridge :

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the woods thereabouts are full of curious insects, and he used to catch the moths by smearing the trunk of a tree with sugar and beer boiled together. A lantern was then placed near the trap; the moths attracted by it came flying round, and were caught by the sticky mixture.

Toads are capital hands, too, at eating bees, when they can get no other insects. A gentleman in Oxfordshire had a hive of bees in the cavity of a wall: a common toad which had taken up its residence in a hole close by was observed to walk forth and place himself at the mouth of the hive, and to catch the bees in their coming from and returning to the hive with much dexterity and activity. After witnessing the toad at work for some time and feeling convinced that, if his depredations were suffered, he would eventually destroy the whole hive, the owner of the bees killed the robber.

Toads are generally reported to be poisonous, and this is perfectly true to a certain extent. Like the lizards, they have glands in their skin, which secrete a white highly-acid fluid, and just behind the head are seen two eminences like split beans: if these be pressed, this acid fluid will come out—only let the operator mind that it does not get into his eyes, for it generally comes out with a jet. There are also other glands dispersed throughout the skin. A dog will never take a toad in his mouth, and the reason is that this glandular secretion burns his tongue and lips. It is also poisonous to the human subject. Mr. Blick, surgeon, of Islip, Oxfordshire, tells me that a man once made a wager, when half

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drunk in a village public-house, that he would bite a toad's head off; he did so, but in a few hours his lips, tongue, and throat began to swell in a most alarming way, and he was dangerously ill for some time. He had probably bitten right through the centre of the glands behind the head, and had got a dose of the poison. This toad's poison mixes readily with water. Under the microscope I find that it appears composed of numerous round cells. A small animal that I inoculated with it was not in any way affected. When first this juice is squeezed out it is in external appearance very like the juice of the sow-thistle, which juice must also have some acrid properties, for it is often used to destroy warts by country people.

But do not let my verdict of *poisonous* cause the destruction of toads by my readers; they are most useful reptiles, and devour thousands of small insects, that would otherwise eat up the vegetation. Gardeners well know this when they turn them into the hot-houses. As proof, I subjoin this testimony from a gardener: "In the autumn of last year a pit wherein I grew melons was so much infested with ants, as to threaten the destruction of the whole crop, which they did first by perforating the skin, and afterwards eating their way into the fruit; and after making several unsuccessful experiments to destroy them, it occurred to me that I had seen the toad feed on them. I accordingly put half-a-dozen toads into the pit, and in the course of a few days hardly a single ant was to be seen."

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“Aridum et ore ferens acinum, semesaque lardi
Frusta dedit, cupiens variâ fastidia cœnâ
Vincere tangentis malè singula dente superbo :
Cum pater ipse domus paleâ porrectus in hornâ
Esset ador loliumque, dapis meliora relinquens.”¹
• Horace, Sat. II. vi. 85.

IN the above lines Horace² amusingly describes the grave hospitality shown by the Country Mouse towards his old friend the Town Mouse, the feast being held, we are given to understand, in “paupere cavo,”³ situated on a rugged mountain side. During the entertainment the conversation turned upon the vanity of mundane affairs, and the certainty of death to all, whether bipeds or quadrupeds: the moral appearing with the dessert—that it behoves rats, as well as men, to be jolly, under whatever circumstances they may happen to be placed. On taking leave, the city beau returned the compliment of the invitation, and his country friend trotted off with him to enjoy, as well as he might, the contrast to his own humble apartments.

¹ “He goes, and freely fetches
Whole ears of hoarded oats and vetches;
Dry grapes and raisins cross her chaps;
And dainty bacon, but in scraps,
If delicacies could invite
My squeamish lady’s appetite.
The matron of the house, reclined
On downy chaff, discreetly dined
On wheat and darnel from a manger,
And left the dainties for the stranger.”—*Francis*.

² One of the greatest of the Roman poets. He died eight years B.C.

³ Miserable burrow.

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Whether other such feasts have taken place since, or whether the London mice are given to the same hospitality towards their brethren as their predecessors of Italy exercised, I know not; but I do know, and we all know, that there are many representatives of this noble and ancient family in London, whose habits and modes of living are exceedingly interesting, and point out to us, that if we only look we may find something to admire and reflect upon in the humblest works of the munificent Creator.

But to our subject :—

There are two kinds of rats known in Great Britain—the black rat and the brown rat. The black rat, or, as it is sometimes called, the old English rat, does not seem to be an aboriginal occupier of the British soil. It is probable that it was introduced into this country from France, the Welsh name for it being to this day, as I have it from a gentleman of Welsh extraction, “*Llygoden Ffrengig*”—“the French mouse;” and I am, moreover, given to understand, on good authority, that it still abounds in the barns and granaries scattered throughout Normandy. We all know the common brown rat when we see it: the black rat is a different-looking animal; he is much slighter in make, his upper jaw projects further over the lower jaw than it does in the brown rat, his ears are much larger, and his tail very much longer than in his first cousin, and lastly his colour is a jet black, with numerous long hairs projecting out from the lower fur-like coat. He is a very timid creature, and rarely shows fight; he is, in fact, not very

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powerful, but his want of strength is made up by his excessive activity. I have examined several, and found their bodies a mass of muscle without a particle of fat.

By the side of the rat now so common in England, the aboriginal rat has no chance; he might get away from him, being more active, but in a pitched battle the brown, through his weight and superior power, must be victorious. Rats, as will be seen hereafter, are very fond of fighting, and are addicted to cannibal habits. In the rat tribe, as well as among ourselves, the maxim that "the weakest goes to the wall" holds good, and the consequence is that the black rat has become very scarce indeed, and the brown rat reigns predominant in his stead. Stuffed specimens, even, are very rare in museums, and the example they have in the British Museum is by no means a good one. I hope to be able to present them with a better. There is a case on record to prove that the Norway rat is the principal agent in the extirpation of the black rat. Some years ago a London rat-catcher shut up together in a cage the result of his day's work, consisting of several dozen rats, of both species, and put them away carefully for the night, their intended fate being to afford sport to his employer's dogs the next morning. What was his astonishment, when he came to fetch them, to find none but brown rats remaining! these cannibals having cruelly devoured all their sable brethren.

The black rat delights not in low haunts, such as cellars, pigsties, nor does he burrow and run into holes, etc., but lives chiefly in the ceilings and

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wainscots of houses, and under the ridge-tiles, and behind the rafters of out-houses. Advantage may be taken of this habit; for the surest way to catch him is to place snares of thin wire, fixed open, on the beams or rafters which he is in the habit of traversing. Into these he will thrust his head, and struggling to escape, will throw himself off the beam, and thereby become strangled in the wire by his own weight.

The author of a curious book—*The Vermin Catcher*, 1768,—confirms this fact. He writes: "I was once exercising my employment at a gentleman's house, and when the night came that I appointed to catch, I set all my traps going as usual, and in the lower part of the house in the cellars I caught the Norway rats, but in the upper part of the house I took nothing but the black rats; I then put them together into the great cage to keep them alive till the morning, that the gentleman might see them, when the Norway rats killed the black rats immediately and devoured them in my presence."

I have been informed that a gentleman who was in the habit of crossing London Bridge early in the morning some years ago, frequently saw whole colonies of black rats out on the mud banks by the river side at low-water; lately, however, they have all disappeared, killed, most probably, by the increasing numbers of the Norway rats from the large granaries and store-houses that have sprung up near the bridge.

An intelligent rat-catcher informs me that the present head-quarters of the old English black rat is the Isle of Dogs; that they abound there in the

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numerous ditches, and come out to feed upon what is left by the tide. In his opinion these black rats are not aboriginal in England, but that they came over originally from Jersey in ships. They thrive, he tells me, in marshy places, particularly where the water is brackish, and there are many such places in Jersey. I have not yet had an opportunity of verifying his assertion. My friend Mr. Coulson, of Clifton, Bristol, most kindly sent me up five beautiful young black rats from Bristol; they were in a large iron cage, and when excited moved about the cage more like birds than rats. I never yet saw other creatures with four legs so active as they: their tails are remarkably long, and they use them as levers to spring by when about to jump. Opening the cage to examine them, one escaped, running under my hand. It took myself, three other persons, and two dogs three quarters of an hour hunting in my room to catch him again—so active was the little brute. We were obliged finally to kill him to get him at all: one of my friends present very appropriately called him “black lightning.”

The other species of rat, now so universally known and generally esteemed a pest by all, is commonly supposed to have come from Norway, and is, therefore, called (but wrongly) the Norway rat. This is a strange mistake, for it would imply that this animal was aboriginal in that country; whereas, in fact, at the time when the name was first applied to it, it was not even known to exist there. How this mistake arose I know not, except from the fact that there exists in Norway a little

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animal, not unlike a rat, called a lemming, described in a treatise entirely devoted to it by the celebrated Danish historian and antiquary, Wormius, about the seventeenth century. This may be the origin of the name; but, however, it made its appearance in Paris about the middle of the eighteenth century, and in England not many years earlier. It is now agreed by most naturalists that it is a native of India and Persia; that it spread onwards into European Russia, and was thence transferred by merchant-ships to England and elsewhere.

This species of rat having nearly exterminated the black rat, has multiplied in the course of years to a fearful extent, and has taken sole possession of every haunt and lurking-place where he can be warm and dry, and at the same time find food in abundance.

What has happened in England has happened elsewhere, viz., the Norway rat has destroyed the aboriginal rat of the country. A gentleman whose family had property in Jamaica, informs me that several rats were imported to that island to keep down the plantation rats. This was not a wise plan, for no sooner had the Norway rats arrived in their new quarters than they multiplied so exceedingly that they became a greater pest than the original rat.

Again, as regards New Zealand, we read in the *Field* newspaper, in answer to a question as to whether any good sporting can be had there, an answer from a gentleman who signs himself Kaiapoi: "With the exception of a small species

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of rat, now nearly extinct, having been all but exterminated by the importation of the common Norway rat, there is not a single indigenous animal in the country; the rats have become a serious nuisance."

Again, another answer to the same question: "In reply, I may state that New Zealand is about the worst country for a sportsman in the world. Nearly a century ago, Captain Cook left pigs and rats upon the island, and these have become a serious nuisance in many parts." I lately saw an advertisement of a man who was "willing to buy any number of live cats for exportation." Doubtless these cats are destined for New Zealand; we shall have the story of Whittington and his cat over again. It is by no means a bad speculation.

But according to a Canterbury paper the tables are now turned here in England against even the Norway rat. We read: "Among the numerous articles for sale in our market on Saturday last was a number of live rats from Australia. When asked what inducement there was to introduce vermin into one's house, we were told such was the antipathy of English rats to those from Australia, that it required only the introduction of some two or three of the Australian breed to extirpate any number of English rats. We were further told that they realized a high price, in consequence, from those who had faith in their frightening propensities." I have heard rumours of the existence of another species of British rat, that has become nearly extinct. Mr. Blick, of Islip, informs me that some years ago he well recollects seeing

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in Leicestershire and Northamptonshire a small species of black water-rat, shaped like a mole, with a long body and short legs and a short thick head; but this rat is now very rare. The fishermen report that the common water-rat has killed them. It is reported that they are still to be found in Barton brook, near Woodstock in Oxfordshire; but I have never yet seen one.

It is a curious, but nevertheless well-ascertained fact, that wherever there is a good habitat for a rat, it is quite certain that there a rat will be. The immediate occupier may be slain, but in a few days the favourite spot will be found out, and taken possession of by another rat, who will in his turn meet the same fate as his predecessor, and will be succeeded by another deluded victim, who is doomed, as the doctors would say, "to be taken as before."

I once had three rats brought to me in a cage; in removing one it got hurt. I fed them, and put them into a stable. The next morning there were only two rats in the cage, the injured rat having been set upon and slain by his fellow-prisoners. They had not only slain him, but had actually begun to eat him, choosing the head to begin upon. Wishing to see the result, I left him, and in the course of the day, although well supplied with bread and milk, these cannibals had nearly devoured their friend. I have preserved the bones as proof of the fact. I afterwards ascertained that it was one only of these rats that was murderously inclined, for he killed and ate every rat put in to him. In the course of about a month, this brute killed five rats

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that were put into his cage. He always began at the neck, just behind the ear. A gentleman at Clapham, to whom I gave some rats, had bred a number in a squirrel's cage, which was hung up in a garden. One morning, not long ago, he looked for the rat in it—a white female with young. Instead of the white rat, he found a great brown male of the common kind coiled up in the nest. The white one was gone, and the young ones all killed and partly devoured. This brown rat must have climbed up a perpendicular smooth iron bar to get at the cage. Out of the hole in the cage, where the intruder got in, the white mother might have got out if she liked, but she preferred staying at home and looking after her young ones.

During summer the rat resides chiefly in holes on the banks of rivers, ponds, and ditches; but on the approach of winter they visit the farm-houses, and enter the corn-ricks and barns, where they devour much of the corn, and damage more than they consume. They are very fond of pig-sties, running about among the pigs, picking up the leavings of the oatmeal out of the troughs, and even nestling down near to the warm body of the fat unwieldy porkers, whose obese sides make not bad pillows for his impudence—the rat.

On one occasion, when a boy, I recollect secretly borrowing an old-fashioned flint gun from the bird-keeper of the farm to which I had been invited. I ensconced myself behind the door of the pig-sty, determined to make a victim of one of the many rats that were accustomed to disport themselves among the straw that formed the bed of the farmer's

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pet bacon-pigs. In a few minutes out came an old patriarchal-looking rat, who, having taken a careful survey, quietly began to feed. After a long aim, bang went the gun—I fell backwards, knocked down by the recoil of the rusty old piece of artillery. I did not remain prone long, for I was soon roused by the most unearthly squeaks, and a dreadful noise as of an infuriated animal madly rushing round and round the sty. What had I done? I had not surely, like the tailor in the old song of the “Carrion Crow,”

“Shot and missed my mark,
And shot the old sow right bang through the heart.”

But I had nearly performed a similar sportsman-like feat. There was poor piggy, the blood flowing in streamlets from several small punctures in that part of his body destined, at no very distant period, to become ham, in vain attempting, by dismal cries and by energetic waggings of his curly tail, to appease the pain of the charge of small shot which had so unceremoniously awaked him from his porcine dreams of oatmeal and boiled potatoes. But where was the rat? he had disappeared, unhurt; the buttocks of the unfortunate pig, the rightful owner of the premises, had received the charge of shot intended to destroy the daring intruder.

To appease piggy's wrath, I gave him a bucket-full of food from the hog-tub: and, while he was thus consoling his inward self, wiped off the blood from the wounded parts and said nothing about it to anybody: no doubt, before this time, some frugal

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housewife has been puzzled and astonished at the unwonted appearance of a charge of small shot in the centre of the breakfast ham, which she procured from Squire Morland, of Sheepstead, Berks.

The frequenters of the Zoological Gardens in Regent's Park may, if the room be quite quiet and the sun warm, observe numerous rats in the den of the rhinoceros. I have frequently watched them playing about, and running backwards and forwards over his thick armour-like hide, as he lies basking in the pleasant sunshine. He evidently thinks them quite beneath his notice, for he makes no efforts to drive them away, beyond occasionally flapping his great ear when they tickle him in any tender part. They come to the rhinoceros' house for the same purpose that they go to the pig-sty, viz., to get what they can from the leavings of their superiors. The keeper informs me that he not unfrequently finds dead rats crushed quite flat in the straw under the place where the rhinoceros has been sleeping. The poor rat has but a small chance of escape when the huge carcase of the great beast comes plump down upon him, and settles itself there for a good long sleep. Rats, too, are also found killed in the same manner in the straw bed of the elephant. These rats probably come out of the straw thatch which covers the building where the rhinoceros and elephant live; they are common also in the deer-house, where they come for the oats, of which they are particularly fond.

If any person wishes to keep rats alive a long time in a cage, let him give them plenty of oats and plenty of water, for the absence of water will kill

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them in a very few hours. A fine full-grown rat was brought to me; it appeared in perfect health and vigour, and when I went near it, it ran about the cage uttering its peculiar cry of alarm, and fixing itself in an attitude of defence up in one corner of the cage. I introduced a spoonful of water to it, and in a moment it seemed to forget its ferocity, for it came up hesitatingly at first, and tasted the water; gaining courage, it soon took hold of the spoon with its fore-paws to steady it, and greedily drank up all the water. I gave it two or three spoonfuls more, and then some wet bread; the next day it had again some wet bread, but not any water. On looking at it the next morning I found my poor rat in the agonies of death. I took it out of its cage and poured some brandy down its throat, at the same time putting its hind feet in hot water, but in vain, it died in my hand. I could find no internal cause for its death; but on consulting a rat-catcher he informed me that it died for want of water without a doubt. I must therefore confess that I unwittingly was the cause of its dying, and for the future I shall know better how to act towards captive rats. One great reason why they are so abundant at the Zoological Gardens is that they have free access to water from the banks of the Regent's canal, as well as plenty of food, which they purloin from the animals.

In the deserts of Africa there are numerous colonies of rats and mice of different kinds; now how do these little beasts live during the droughts without water? The all-wise and ever kind Creator has provided for their wants. An African

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traveller, Campbell, writes—"I was surprised how so many mice could have lived without water till I observed them rolling berries from succulent plants into their holes. On examining one of the largest of these berries I found it contained about three teaspoonfuls of water. This is a provision God has made to supply the wants of these little animals." Man, too (the poor Bushman), is supplied with water from a similar source, for he finds growing in arid and dry places natural water reservoirs in the shape of "melons, which being roasted yield good water."

As a curious instance of the way in which animals always find out the place best adapted for their habitation, I may adduce the fact that at the Zoological Gardens, although the rats swarm not ten yards away from the parrot-house, yet they never come *into* this building. Here mice take their place. How is this? The rats have probably found out that it is no use going there, they would get nothing for their trouble, for they could not get through the bars of the birds' cages to get at the seed; the little mice, on the contrary, who, as all well know, are great seed-eaters, with ease run in and out between the wide bars of the parrots' cages, and help themselves both to seed and water. They have found out that, although the great cockatoo has such an enormous and formidable-looking bill, it won't hurt them, and that Mr. Cockatoo is not a carnivorous bird. When, therefore, these gaudy denizens of the tropics have finished their day's screaming and "pretty polly-ing," out pop the little mice, taking tithe of all the

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seed-boxes they can get at. Having finished their meal they retire behind the hot water pipes which run round the room, and with full stomachs lie lazily in their warm and comfortable quarters alongside the pipes till they are hungry again.

Rats are very fond of warmth, and will remain coiled up for hours in any snug retreat where they can find this very necessary element of their existence. The following anecdote well illustrates this point :—My late father, when Fellow of Corpus College, Oxford, many years ago, on arriving at his rooms late one night, found that a rat was running about among the books and geological specimens, behind the sofa, under the fender, and poking his nose into every hiding-place he could find. Being studiously inclined, and wishing to set to work at his books, he pursued him, armed with the poker in one hand, and a large dictionary, big enough to crush any rat, in the other, but in vain; Mr. Rat was not to be caught.

No sooner had the studies recommenced, than the rat resumed his gambols, squeaking and rushing about the room like a mad creature. The battle was renewed and continued at intervals, to the destruction of all studies, till quite a late hour at night, when the pursuer, angry and wearied, retired to his adjoining bedroom: though he listened attentively, he heard no more of the enemy, and soon fell asleep. In the morning, he was astonished to find something warm lying on his chest; carefully lifting up the bed-clothes he discovered his tormentor of the preceding night quietly and snugly ensconced in a fold in the blanket, and taking

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advantage of the bodily warmth of his two-legged adversary. These two lay looking daggers at each other for some minutes, the one unwilling to leave his warm berth, the other afraid to put his hand out from under the protection of the coverlid, particularly as the stranger's aspect was anything but friendly, his little sharp teeth and fierce little black eyes seeming to say, "Paws off from me, if you please!"

At length, remembering the maxim that "discretion is the better part of valour"—the truth of which, I imagine, rats understand as well as most creatures—he made a sudden jump off the bed, scuttled away into the next room, and was never seen or heard of afterwards.

In my college rooms at Christ Church, a bachelor rat had taken up his quarters, but where these quarters were I never could find; he used to appear on the floor when all was quiet and disappear again on the slightest noise. I never could catch him, but he was a terrible nuisance, for he made a great noise running about during the night. The scout used to put out the breakfast before the chapel hour, and when I returned I frequently found marks of the rat's paws and teeth on the butter-pat. What became of him in the long vacation I could not tell; on my return to the rooms he soon re-appeared. At last I found his retreat: it was under a heap of papers on a side table, and he had made his nest in an old college cap. He had lined it with pieces gnawed off the carpet, and had made a fine store of provisions in the shape of bits of bread, cake, cheese, and everything edible he could

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find about. The collection was so various that I made a catalogue at the time.

The love of warmth brings many rats out of the sewers to take their siestas in the large hair warehouses in Lambeth. They only come in the day, and decamp at night, probably in quest of food. They have made runs up on to the floors where the hair is placed to dry, and, finding a nice soft bit, roll themselves up quite into a ball; the outside of which is horse-hair, the nucleus a live rat. The boys connected with the establishment have found this out, and go feeling among the hair with their hands. The moment they come on a lump harder than the rest, they pounce upon it without fear, for the rat cannot bite through his thick self-made great-coat; they then rush off to a tub of water and shake poor Mr. Rat out of his hairy (not downy) bed into the merciless element, when he is soon drowned.

Let us here pause for a moment, and see whether, with all his bad qualities, we cannot find some good trait joined, and something to admire in the construction of his body, as adapted to his very peculiar mode of life.

The rat is one of the most despised and tormented of created animals; he has many enemies and very few friends; wherever he appears his life is in danger from men, dogs, cats, owls, etc., who will have no mercy on him. These perpetual persecutions oblige him to be wary in his movements, and call for a large amount of cunning and sagacity on his part, which give his little sharp face a peculiarly knowing and wide-awake appearance, which the

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most superficial observer must have noticed. Though, poor creature, he is hated and killed by man, his sworn foe, yet he is to that same ungrateful race a most useful servant, in the humble capacity of scavenger; for wherever man settles his habitation, even in the most remote parts of the earth, there, as if by magic, appear our friends the rats. There were thousands of rats in the camp before Sevastopol; and a rat-hunt in the trenches was not an uncommon occurrence. Again, they swarm at the camp at Aldershot: the sentries see them at night going to the nearest water to drink. The rat quietly takes possession of the out-houses, drains, etc., and occupies himself by devouring the refuse and filth thrown away from the dwelling of his master (under whose floor, as well as roof, he lives). This refuse, if left to decay, would engender fever, malaria, and all kinds of horrors, to the destruction of the children of the family, were it not for the unremitting exertions of the rats to get rid of it, in a way no doubt agreeable to themselves, namely, by eating it. Let us take an example. The sewers adjoining a connected series of slaughter-houses, as Newgate-market, White-chapel, Clare-market, etc., are often nearly choked up with offal and the foul refuse of animal matter, swept into them by the careless butchers. It may be imagined what fearful maladies would arise from this putrid mass if it were allowed to stay there neglected. How is this evil result prevented? Why, by the poor, persecuted rats, who live there in swarms, and devour every morsel of concentrated cholera as it comes down to them, profiting,

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thereby, themselves and the inhabitants of the houses who reside above their haunts.

The late Professor Coleman remarked that a rat was the only animal who would thrive, and always have a clean coat, living, at the same time, in the most filthy and stinking places. And he was right; for a rat will live in air that would be fatal to any other animal. Hence, too, we see why the rat is always cleaning himself. Never does a rat finish a bit of food, or is touched by human hand, but that he cleans himself immediately afterwards.

An old book on natural history thus describes the rat's personal appearance :—"The eyes are large and black; the tail is covered with minute scales, mixed with a few short hairs; and the general figure is disgusting." Now this very tail, ugly as it may appear, is mentioned by the great Cuvier as one of the first things that struck his mind, as demonstrating the bounty of the Creator towards the humblest of his creatures, in adapting their bodily formation to the peculiar mode of life which He intended them to enjoy. We all admire the wonderful construction and admirable working together of the numerous muscles of the human hand and forearm, yet, says Cuvier, "there are more muscles in a rat's tail than there are in that part of the human economy we admire so much, the hand."

The tail is indeed a most useful appendage to the rat : it is composed of a chain of small bones, with a multitude of muscles above mentioned to move them. "Many minute scales and short hairs cover it, and thus constructed it becomes prehensile,

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as the tails of many monkeys and lemurs ; ” in fact, a sort of hand to the rat, by means of which he is enabled to crawl along the tops of railings, and along narrow ledges of walls, balancing himself by it, or entwining it round the projecting portions of the difficult passages along which his course lies. By means of it, too, he is enabled to spring up heights otherwise inaccessible, using it on these occasions (like the kangaroo), as a lever, or rather as a projectile spring. When, moreover, according to a story which requires confirmation, the delicious oil or sweet wine lies beneath his reach in the long-necked bottle, his ever-useful tail serves him in good turn ; he dips it into the coveted fluid, and then enjoys the reward of his sagacity, and says to himself, as he licks it up, “ What’s a rat without a tail ? ”

He can climb up trees also, for many years ago a gentleman who had rooms at Christ Church, Oxford, looking on to a garden belonging to Oriel College opposite, observed the rats climb up the currant-bushes and eat the fruit, while the boughs were bending, and almost breaking with their weight. The loss of the fruit was put down to biped thieves ; nobody ever thought of the rats.

We all know that rats can burrow well. Mr. Bishop, the celebrated gun-maker of Bond-street, tells me that he recollects that at Ealing, near London, there were, once upon a time, some gooseberry-trees, planted in a row. These trees suddenly died, and they died in a regular order, one after the other. Nobody could tell the reason, till one day a tree was dug up, and its roots were found “ stript

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off as if with a scissors." They found, also, a hole under the trees, and at the end of the hole an enormous rat. "This rat," says Bishop, "had begun at the first tree, gone on to the second, and so on till it had eaten the roots of all the trees, and killed them." I tell the tale as it was told to me.

The rat is admirably armed and equipped for the peculiar mode of life which he is ordained to lead. He has formidable weapons in the shape of four small, long, and very sharp teeth, two of which are fixed in the upper and two in the under jaw. These are formed in the shape of a wedge, and by the following wonderful provision of Nature, have always a fine sharp cutting edge. On examining them carefully, we find that the inner part is of a soft, ivory-like composition, which may be easily worn away, whereas the outside is composed of a glass-like enamel, which is excessively hard. The next time the reader has a boiled rabbit for dinner, let him perform a simple experiment and convince himself of this peculiar structure common to the rat, rabbit, and, in fact, to all rodent animals. Let him extract from the rabbit's jaw one of the teeth, and with his penknife let him ascertain the comparative hardness of the two component parts of the tooth: he will find that he will be able easily to cut away the internal softer portion, but that the external hard, glass-like enamel of the tooth will be so hard that it will not only resist the knife, but will readily cut and scratch the human nail. He will also, if the rabbit be not boiled too much, observe that the lower end of the tooth is quite hollow and contains a jelly-like substance. This

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substance is the pulp of the tooth, which, by the addition of earthy matter, and gradually growing onwards, ultimately becomes hard, true tooth-material. On showing a rat's tooth, taken out of its socket, to a friend who has been through the worst part of the Crimean campaign, he looked at it attentively and said, "Ah, if a Zouave had that he would soon fasten it on to a bit of stick, and turn it to some useful purpose."

The upper teeth work exactly into the under, so that the centres of the opposed teeth meet exactly in the act of gnawing; the soft part is thus being perpetually worn away, while the hard part keeps a sharp, chisel-like edge; at the same time the teeth grow up from the bottom, so that as they wear away a fresh supply is ready. The consequence of this arrangement is, that if one of the teeth be removed, either by accident or on purpose, the opposed tooth will continue to grow upwards; and as there is nothing to grind it away, will project from the mouth and be turned upon itself; or if it be an under tooth it will even run into the skull above.

There is a curious but little known fact, which well illustrates the ravages which the rats can inflict on a hard substance with their little sharp teeth. Many of the elephants' tusks imported into London for the use of the various workers in ivory are observed to have their surfaces grooved into small furrows of unequal depths, as though cut out by a very sharp-edged instrument. Surely no man would have taken the trouble to do this, for what would be the profit of his labour? The rats, how-

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ever, have found out there is something worth working for, or else, clever fellows, they would not have used their chisel-like teeth with such effect. They have discovered which tusks contain the most gelatine or animal glue—a sweet and delicious morsel for their dainty palates; and, having gnawed away as much as suited their purpose, have left the rest for the ivory-cutter; he, for his part, is neither unable nor unwilling to profit by the fact marked out by the rats' teeth; for ivory which contains gelatine is particularly valuable for many purposes.

Being anxious to get further evidence on this point, I called upon Mr. Robert Thomas Fauntleroy, of the great ivory firm in Tooley Street, near the London Bridge Station. He most politely and kindly took me into his warehouse, where, arranged on shelves, and placed on the floor, I saw more elephants' tusks than I ever saw together before in my life, representing altogether a vast amount of capital. In these rooms were tusks of elephants from all parts of the world where elephants exist—from India, Ceylon, North Africa, the Cape, Siam, etc.; each having their *peculiar characteristics*, which I cannot now go into, as this is not a special treatise on ivory. In the room devoted to the tusks from India a delicious odour pervaded the whole place; this proceeded from the Indian spices and other foreign aromatic substances, which had been packed with the tusks. In the room set apart for African ivory, I scanned the rows of tusks, and to my delight found many—nay, very many—gnawed by rats; guessing roughly, about

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one tusk in twenty was rat-gnawed. Now from experience I can swear to the mark of a rat's tooth, whether the material gnawed be hard or soft, and if ever I saw the marks of rats' teeth, it was upon these tusks. The rats had touched only just the tip of the tooth, and in one instance they had gnawed the tip quite away, leaving a blunt stump; this must have been a particularly savoury tusk. In one tusk only could I find marks at the upper end, and these but very slight: the rat had been making an experiment to see whether it was good; he had found out that there was but little gelatine up there, and therefore had not prosecuted his researches. It is a curious fact, as narrated to me by Mr. Jaques, the ivory-turner of Hatton Garden, that the rats gnaw the African ivory, more especially that which is called green ivory, on account of its amber-tinted, transparent colour; Indian ivory they will not and do not touch; there is not enough gelatine in it to make it worth their while to be at the trouble of gnawing. Even of the African ivory they touch only the tip and lower extremity, and why? because it is the purest, and densest, and softest part of the tusk.

Rats have a remarkable instinct for finding out where there is anything good for food; and it has been often a subject of wonder how they manage to get on board ships laden with sugar and other attractive cargoes. This mystery has, however, been cleared up, for they have been seen to come off shore to the ship by means of the rope by which she is moored to the quay, although at some distance from the shore. By the same means they

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will leave the ship when she comes into port, if they find their quarters filling or filled with water; hence the saying, that "rats always leave a sinking ship," is perfectly true. If, however, the ship be watertight, they will continue breeding to an enormous extent. M. de St Pierre informs us, that on the return of the *Valiant* man-of-war from the Havannah, in the year 1766, its rats had increased to such a degree that they destroyed a hundredweight of biscuit daily. The ship was at length smoked between decks, in order to suffocate them; and six hampers were for some time filled every day with the rats that had thus been killed.

Rats are not selfish animals; having found out where the feast is stored, they will kindly communicate the intelligence to their friends and neighbours. The following anecdote will confirm this fact. A certain worthy old lady, named Mrs. Oke, who resided at Axminster several years ago, made a cask of sweet wine, for which she was celebrated, and carefully placed it on a shelf in the cellar. The second night after this event she was frightened almost to death by a strange unaccountable noise in the said cellar. The household was called up, and a search made, but nothing was found to clear up the mystery. The next night, as soon as the lights were extinguished and the house quiet, this dreadful noise was heard again. This time it was most alarming; a sound of squeaking, crying, knocking, pattering feet; then a dull scratching sound, with many other such ghostly noises, which continued throughout the live-long night. The old lady lay in bed with the candle

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alight, pale and sleepless with fright, anon muttering her prayers, anon determined to fire off the rusty old blunderbuss that hung over the chimney-piece. At last the morning broke, and the cock began to crow. "Now," thought she, "the ghosts must disappear." To her infinite relief the noise really did cease, and the poor frightened dame adjusted her nightcap and fell asleep. Great preparations had she made for the next night; farm servants armed with pitchforks slept in the house; the maids took the family dinner-bell and the tinder-box into their room; the big dog was tied to the hall-table. Then the dame retired to her room, not to sleep, but to sit up in the arm-chair by the fire, keeping a drowsy guard over the neighbour's loaded horse-pistols, of which she was almost as much afraid as she was of the ghost in the cellar. Sure enough her warlike preparations had succeeded; the ghost was certainly frightened; not a noise, not a sound, except the heavy snoring of the bumpkins, and the rattling of the dog's chain in the hall could be heard. She had gained a complete victory; the ghost was never heard again on the premises; and the whole affair was soon forgotten.

Some weeks afterwards some friends dropped in to take a cup of tea, and talk over the last piece of gossip. Among other things the wine was mentioned, and the maid sent to get some from the cellar. She soon returned, and gasping for breath, rushed into the room exclaiming,—"'Tis all gone, ma'am;" and sure enough it was all gone. "The ghost has taken it,"—not a drop was left, only the empty cask remained, the side was half eaten

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away, and marks of sharp teeth were visible round the rugged margins of the newly-made bung-hole.

This discovery fully accounted for the noise the ghost had made, which caused so much alarm. The aboriginal rats in the dame's cellar had found out the wine, and communicated the joyful news to all the other rats in the parish; they had assembled there to enjoy the fun, and get very tipsy (which, judging from the noise they made, they certainly did) on this treasured cask of wine. Being quite a family party, they had finished it in two nights, and having got all they could, like wise rats, they returned to their respective homes, perfectly unconscious that their merry-making had nearly been the death of the rightful owner and "founder of the feast." They had first gnawed out the cork, and got as much out as they could: they soon found that the more they drank the lower the wine became. Perseverance is the motto of the rat, so they set to work and ate away the wood to the level of the wine again. This they continued till they had emptied the cask: they must then have got into it and licked up the last drains, for another and less agreeable smell was substituted for that of wine. I may add, that this cask, with the side gone and the marks of the rats' teeth, is still in my possession.

Rats, like men, being kindly disposed, often give information of good things to others, which, alas! may prove in the end to be the destruction both of the informers and the informed. I give a case in point.

A country gentleman was much annoyed by a

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colony of rats which had settled in his cellars, and, though he caught several of them in traps, yet he never could succeed in getting rid of them entirely. At last, knowing well the habits of the animal, he determined on destroying the whole colony at one grand *coup*. He therefore procured a large box, and, having half filled it with meal, sat himself down in the cellar by the side of it, concealing his person under some sacks, and leaving only a spy-hole for his eyes. The rats soon poked their noses out to reconnoitre, timidly at first, but soon they came out and began to eat the meal sprinkled about, cautiously, however, keeping one eye upon the mysterious bundle in the corner.

The next night he repeated the same plan of action. The rats this time were bold enough to get into the box by means of little ladders placed for them. The first of them was rewarded by a plentiful feast of meal, and was soon joined by many hungry companions.

On the fourth night, however, it was determined to put an end to their proceedings. By this time the rats had lost all fear, and had spread the news far and wide of their good fortune, so that there was a large assembly of them in the box, greedily devouring the remains of the meal, unsuspecting of the fate that awaited them at the hands of the apparently innocent bundle, of which they had now no dread.

Mistaken creatures ! up rose the executioner, and down went the lid. The rats became prisoners under a padlock, with strong oak boards between them and liberty. The next morning the box and

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its living contents were lifted into the yard, and, at a signal, launched into a horse-pond. It swayed to and fro, and while kept under water with poles by two men, the numerous bubbles of air escaping from the chinks of the box told plainly of the death-struggles of the little quadrupeds within.

At length all was quiet. The colony of rats, which had possessed the cellar for so many generations, was no more. Their holes were filled up with mortar mixed with glass, until a new generation should arise to meet the same fate in some future meal-box.

The rat, though naturally a savage creature, is, by dint of kindness, capable of being tamed and made obedient to the will of man. Some of the Japanese tame rats and teach them to perform many entertaining tricks; and thus instructed exhibit them as a show for the diversion of the populace.

We read in the *Naturalists' Cabinet*, 1806, that "a gentleman travelling through Mecklenburg about forty years ago, was witness to a very singular circumstance in the post-house at New Hargard. After dinner, the landlord placed on the floor a large dish of soup, and gave a loud whistle. Immediately there came into the room a mastiff, a fine Angora cat, an old raven, and a remarkably large rat, with a bell about its neck. They all four went to the dish, and without disturbing each other, fed together, after which the dog, cat, and rat lay before the fire, while the raven hopped about the room. The landlord, after accounting for the familiarity which existed among these animals, informed his guest that the rat was

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the most useful of the four, for the noise he made had completely freed the house from the other rats and mice with which it had previously been infested.

But capacity for becoming tame and accustomed to the presence of man, is not confined to the "foreigner" rats; I myself have had many tame ones.

When carrying on my observations on rats, I bought a pair of piebalds, and put them in a case, which formed a capital cage for them. In the course of a few weeks my colony increased to an enormous extent : I had specimens of almost every kind of rat—the pure white albino rat with pink eyes, the common brown rat, the true black rat, and the snake or ship-rat. All my rats knew me well. The moment I came to the room they swarmed round the door of the cage, and I was obliged to keep them back while I put in their food, as a huntsman does to his hounds. At feeding-time there was not a single rat in the cage that I could not take up and handle with impunity; they never offered to bite me. If, however, a stranger tried to touch them, they were all up on their hind legs in a fighting attitude in a moment. The snake or ship-rats, however, I acknowledge beat me. I got two from the docks, and unwisely turned them in with the others. In a few moments a most tremendous fight began—snake-rats *versus* the company. I put them into another cage by themselves, after having had the greatest difficulty in catching them; and this, first, because the moment I got hold of their tails the skin came off in my hand, and, secondly, they were so tremen-

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dously active that having caught them I could hardly hold them.'

When you wish to catch an ordinary rat, seize his tail, and lift him from the ground: at this instant he will try to turn up and bite, and a most severe bite he will give if you don't keep perpetually twisting him round and round—he then can't turn upwards; then having caught him in the right hand by the tail, swing him under the left arm. The rat will immediately endeavour to get away, and so doing fix himself on your waistcoat; bring your arm to your side, and you have him a prisoner, then if you wish further to examine him put the fore-finger of the right hand behind his right shoulder and the thumb in front of the left, he is secure and can't possibly bite; don't squeeze too much or he will die, for a rat is a tender beast, and does not require much killing. The snake-rats, however, managed to twist round; one made his teeth meet in my hand, so I let him go. A day or two afterwards I found the remains of his body eaten by the common, or, as I then called them, the wild rats, who used to come nightly to the tame rats' cage to see what they could pick up. This, I think, was the only time I was ever bitten by a rat, but I should nevertheless advise a novice to be careful what he is about in his first attempts.

Rat-catchers will frequently tell you that, to prevent the rats biting them, they put some preparation disagreeable to the rats upon their hands; but this is not the truth. It is done by knowing the habits of the animal. I subjoin the experience of an old rat-catcher on this subject:—

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· “Rats may be taken out of the cage very easily; for, if you don't hurt them, they will not bite you; for, by standing together in the trap, they are cowed, and have not the least notion of biting, unless you should happen to squeeze them too hard as you catch them one by one with your hand. There is a wide difference in the temper and disposition of these animals; for some are so savage and untamed, that they will set up their backs, looking very fiercely, and crying out if you do but look at them: but when you meet with one of this kind, shake him well in the cage, together with the rest, and observe when he has put his head among the others, and take him out by his tail, and he will not bite you; but observe, when you have first caught them, do not go to handle them directly, for then they are so mad and furious that they will bite anything.”

I have frequently had rats brought to me in iron cages. On arrival they have shown themselves exceedingly fierce, biting at everything and uttering their peculiar cry of alarm when I went near them. In the course of a few hours they become pretty tame, even eating bread and milk out of a spoon introduced between the bars. In a day or two they take no notice of me whatever, except to beg for food with their noses through the bars when I go near; and here, be it observed, a rat invariably washes himself all over after eating, no matter what. The operation is performed just as a cat does it, viz., by licking the paws. They are naturally exceedingly clean animals.

When a rat eats, he, by means of his sharp front

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teeth, gnaws away a mouthful, which he deposits in a sort of pouch formed between his grinding teeth and his cheeks; then he ceases gnawing and masticates his food, by moving his jaws incessantly and without pausing. They move ten times faster than the jaws of a rabbit. When a rat drinks, he laps up the fluid like a dog, and does not suck it up like a sheep. A rat generally tastes his food with his tongue previous to eating it. It is curious to see a rat asleep. I never saw it but once, and that in a case where the animal was ill. It is as difficult to catch a rat asleep as it is a weasel. The rat coils himself into a ball, and places his nose down between his hind legs : his tail is curled up round the outside of his body : he then looks like a mass of hair. No part of his body projects but his two delicate ears, which are beautifully adapted for catching the least sound, and which seem to be placed there as sentries; and pretty sharp sentries they are. It is certainly not the case, as has been stated elsewhere, "that the garbage on which rats live poisons their teeth and renders the wounds they make deadly." A rat, though living in and among garbage, is always clean in its person, and his teeth are always beautifully clean; the yellow-looking substance on the front part of the tooth is its natural colour, and not the result of the accumulation of tartar.

Talking of tame rats, I knew a worthy whip-maker who worked hard at his trade to support a large family. He had prepared a number of strips of leather, by well oiling and greasing them. He carefully laid them by in a box, but, strange to

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say, they disappeared one by one; nobody knew anything about them, nobody had touched them.

However, one day, as he was sitting at work in his shop, a large black rat, of the original British species, slyly poked his head up out of a hole in the corner of the room, and deliberately took a survey of the whole place. Seeing all quiet, out he came, and ran straight to the box wherein were kept the favourite leather strips. In he dived, and quickly reappeared, carrying in his mouth the most dainty morsel he could find. Off he ran to his hole, and quickly vanished. Having thus found out the thief, the saddler determined to catch him. He accordingly propped up a sieve with a stick, and put a bait underneath; in a few minutes out came the rat again, smelling the inviting toasted cheese, and forthwith attacked it. The moment he began nibbling at the bait, down came the sieve, and he became a prisoner. "Now," thought he, "my life depends upon my behaviour when this horrid sieve is lifted up by that two-legged wretch with the apron on, who so kindly cuts the greasy thongs for me every day: he has a good-natured looking face, and I don't think he wants to kill me. I know what I will do."

The whipmaker at length lifted up the sieve, being armed with a stick ready to kill Mr. Rat when he rushed out. What was his astonishment to see that the rat remained perfectly quiet, and, after a few moments, walk quietly up on his arm, and look up in his face, as much as to say, "I am a poor, innocent rat, and if your wife *will* lock up all the good things in the cupboard, why, I must eat

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your nicely-prepared thongs; rats must live as well as whipmakers." The man then said, "Tom, I was going to kill you, but now I won't; let us be friends. I'll put you some bread and butter every day if you will not take my thongs and wax, and leave the shopman's breakfast alone; and—but I am afraid you will come out once too often; there are lots of dogs and cats about who won't be so kind to you as I am; you may go now."

He then put him down, and Mr. Rat leisurely retreated to his hole. For a long time afterwards he found his breakfast regularly placed for him at the mouth of his hole, in return for which he, as in duty bound, became quite tame, running about the shop, and inquisitively turning over everything on the bench at which his protector was at work. He would even accompany him into the stables when he went to feed the pony, and pick up the corn as it fell from the manger, keeping, however, a respectful distance from the pony's legs. His chief delight was to bask in the warm window sill, stretching his full length to the midday sun. This unfortunate though luxurious habit proved his destruction, for one very hot day, as he lay at his ease taking his siesta, the dog belonging to the bird-shop opposite espied him afar off, and instantly dashed at him through the window. The poor rat, who was asleep at the time, awoke, alas! too late to save his life. The cruel dog caught him, and took him into the road, where a few sharp squeezes and shakings soon finished him. The fatal deed being done, the murderous dog left his bleeding victim in the dusty road, and, with ears and tail

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erect, walked away as though proud of his performance. The dog's master, knowing the history of the rat, had him stuffed, and his impaled skin, with a silver chain round the neck, forms to this day a handsome addition to the shop-front of the bird-shop in Brompton.

Another still more remarkable instance of a tame rat has come to my knowledge.

Some time ago the driver of a Bow and Stratford omnibus was moving some trusses of hay in his hay-loft, when, snugly coiled up in a corner, he found a little miserable-looking rat, whose mamma, having carefully tucked him up in bed, had gone out on a foraging expedition to find something for her darling's supper. The little fellow being of a remarkable piebald colour, excited the pity of the omnibus man, who took him up, and brought him home to his family. The little children soon took to their new pet, and named him Ikey, after their eldest brother, whose name was Isaac. The little creature soon grew up, and reciprocated the kindness he had received, by excessive tameness towards every member of the family. He was therefore allowed to roam about the house at perfect liberty. His favourite seat was inside the fender, or on the clean white hearth, but, strange to say, he would never get on it unless it was perfectly clean. On one occasion, when the goodwife was cleaning the hearth, she gave Master Rat a push; up he jumped on the hob, and finding it an agreeable resting-place, there he stayed. As the fire grew brighter and brighter, so the hob became warmer and warmer, till at last it became unpleasantly

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hot; but he would not move from his perch till the hair on his legs and body became quite singed with the heat.

His master had perfect control over him, and made, for his special benefit, a little whip, with which he taught him to sit upon his hind legs in a begging posture, jump through a whalebone hoop, drag a small cart to which he was harnessed, carry sticks, money, etc., in his mouth, and perform many other amusing tricks.

The rat perfectly understood the meaning of the whip, for whenever it was produced, and his master's countenance betrayed coming wrath, in fear and trembling he would scamper up the sides of the room or up the curtains, and perch himself on the cornice; waiting there, till a kind word from his master brought him down again, hopping about, and squeaking with delight. In these gambols of mirth he would run so fast round after his tail, that it was almost impossible to distinguish what the whirling object was. At night he would exhibit another cat-like habit, for he would stretch himself out at full length before the fire, on the rug, seeming to enjoy this luxurious way of warming himself. This love of warmth made him sometimes a troublesome creature, for when he found the fire going out and the room becoming cold, he would creep up into his master's bed, and try to insert his little body under the clothes. He was never allowed to remain here long, but was made to decamp as soon as his presence was discovered. He then took up his refuge in the folds of his master's clothes, which were placed on a chair, and of these he was allowed to retain quiet

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possession till the morning. The master became so fond of his rat that he taught him at the word of command, "Come along, Ikey," to jump into his greatcoat pocket in the morning, when he went out to his daily occupation of driving the 'bus.

He did not, however, carry him all day in his pocket, but put him in the boot of his 'bus to act as guard to his dinner. But why did not the rat eat up his master's dinner? because, as said the man, "I always gives him his fill when I has my own breakfast before starting." The dinner was never touched, except when it happened to consist of plum-pudding. This Ikey could not resist; his greediness overcame his sense of right, and he invariably devoured the plums, leaving the less dainty parts of the repast for his master. The rat acted as a famous guard to the provisions, for whenever any of the idle fellows who are always seen lounging about the public-houses where the omnibuses bait, attempted to commit a theft, and run off with the bundle out of the boot, Ikey would fly out at them from under the straw, and effectually put to flight the robbers.

At night he was taken home in his master's pocket, and partook of the family supper; but if any strangers happened to be present, he was taken with a shy fit, and, in spite of his hunger, secreted himself till they had gone.

His teeth, after a time, became bad and worn out, and the children finding this out, delighted to give him a sort of hard cake made of treacle, called, in infant parlance, jumbles, or brandy-snaps. Of these Ikey, in his younger days, was very fond; but

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now, on the contrary, they gave him much trouble to masticate, and his perseverance and rage when attacking the said brandy-snaps caused the young folks many a hearty laugh.

This rat is, I believe, still alive and enjoys good health, though, the weight of age pressing on his hoary head, he requires many little attentions from his kind and tender-hearted protectors.

An amusing incident took place not long ago in the Vauxhall Bridge Road, which a bystander afterwards described to me. A rat-catcher, carrying a cage with six rats in it, entered a public-house : he unwisely left his cage on the form outside. The folding-doors of the tavern had no sooner closed, than a band of young urchins who had been following at a respectful distance came up and espied the cage, and the rats within. "Let's have a lark," says the greatest rogue of the party. "Look here, here are some rats in a cage ; where is the man what belongs to the rats ?" "He is in the public-house," exclaimed his comrades, "I seed him go in." "Let's let 'em out, and see if they will run," continued the first speaker. "I'll tell the man, I'll tell your mother if you do," exclaimed a timid, white-haired lad. "I will, though," said the other ; "here goes." He accordingly opened the door of the cage, and out they all bolted in an instant. "Master, master, your rats are gone !" exclaimed the whole party assembled. Out came the old rat-catcher with the half-emptied porter pot in his hand, exclaiming, "Where, where ?" "There, there, up the street, master, run." The old man dashed down the pot, and away he went up the road

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as hard as he could go. The rats in the meantime made best use of their liberty, and were scampering up the middle of the dusty road, jumping and squeaking, with their long tails well stretched out behind them, running in a straight line, one behind the other like horses in a well-contested race. They did not seem inclined to listen to the oaths and injunctions of the old man in pursuit, but continued their course direct to a heap of bricks and rubbish close by. Here the old man pulled up, arriving some minutes after the rats, and then, dashing down his cap, exclaimed, "It's no use running after 'em : if they go at that rate they will get home before me ; however, I dare say I shall meet with my friends another day, let 'em go and enjoy themselves while they can !" With these words he ran back again in pursuit of the young miscreants, the cause of all his misfortune ; they too, like the rats, had quicker legs than the old man, and again he was unsuccessful in his pursuit. Like a wise man, therefore, he picked up his empty cage and retired again to the tap-room, to console himself for the loss of his rats, to abuse the whole race of boys in general, and the boys in the Vauxhall Road in particular.

There is a curious fact connected with the habits of the rat, which warrants a closer observation on the part of those who have the opportunity—it is the emigration of rats. It appears that rats, like many birds, fish, etc., are influenced to change their abode by want of food ; by necessity of change of temperature ; by want of a place for incubation, where they may obtain food for their young ; and, lastly, by their fear of man.

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“A Spanish merchant some years ago had forestalled the market of Barcelona filberts on speculation. He filled his warehouse with sacks of them, and refused to sell to the retail dealers, except at such a price as they could not afford to give. Thinking, however, that they would be obliged to submit to his demand, rather than not procure them for sale, he persisted in exacting his original price, and thus lost nearly all his treasure; for he was informed, by an early-rising friend, that he had seen, just before sunrise, an army of rats quitting the warehouse. He immediately went to examine his sacks, and found them gnawed in various places, and emptied of above half their contents, and empty shells of filberts strewed over the floor.”

Pennant relates a story of a burglarious troop of rats, which nearly frightened a young lady out of her wits, by mistaking her chimney for one leading to a cheese-room. She was suddenly awakened by a tremendous clatter in her bed-chamber, and on looking up saw a terrific troop of rats running about in wild disorder. She had presence of mind enough to throw her candlestick at them, and to her great joy she found that they speedily departed by the way which they had entered her apartment, leaving only a cloud of soot over the room.

I have heard that some years ago there was a lone house standing by itself near a plantation, not far from Guildford. This house nobody would ever take because it was haunted, and strange noises heard in it every night after dark; several tenants tried it but were frightened away by the

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noises. At last, one individual, more courageous than the rest, resolved to unravel the mystery. He accordingly armed himself cap-a-pie, and having put out the light remained sentry in one of the rooms. Shortly he heard on the stairs pit, pat; a full stop, then pit, pat; a full stop again. The noise was repeated several times, as though some creature, ghost or no ghost, was coming up stairs. At last the thing, whatever it was, came close to the door of the room where the sentry was placed and listening; his heart, too, chimed in with the tune pit, pat, rather faster than it was wont to do. He flung open the door—hurry skurry, bang; something went down stairs with a tremendous jump, and all over the bottom of the house the greatest confusion, as of thousands of demons rushing in all directions, was heard. This was enough for one night.

The next night our crafty sentry established himself on the first landing with a heap of straw and a box of lucifer-matches; soon all was quiet. Up the stairs again came the pit, pat, pit, pat. When the noise was close to his ambush he scraped his match and set fire to his straw, which blazed up like a bonfire in an instant; and what did he see? only a rabbit, who stood on his hind legs, as much astonished as was the sentry. Both man and beast having mutually inspected each other, the biped hurled a sword at the quadruped, who disappeared down stairs quicker than he came up. The noise made was only the rabbit's fore and hind legs hitting the boards as he hopped from one stair to the other. The rabbits had got into the house from the neigh-

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bouring plantation, and had fairly frightened away; by their nocturnal wanderings, the rightful owners thereof. The more courageous sentry was rewarded for his vigil, for he held his tongue as to the cause of the ghost. He got the house at a reduced rent, and several capital rabbit pies made of the ghosts' bodies into the bargain. *

That rats will emigrate we well know from experience. My father, when Canon of Christ Church, Oxford, was usually in residence during the long vacation; when the young men went away, their rooms, in consequence, became bare of food for the rats, and they all migrated to my father's house in Tom quadrangle; many scores of them I myself have caught in traps at that particular time of the year. When term commenced again, the rats went away, only to reappear at the next vacation. The same thing happens at Westminster: the Canons' houses there have numerous rats in them when the Westminster boys are gone home for their holidays.

On the bleak and bare downs, near Isley, in Berkshire, not very far from the Didcot station of the Great Western Railway, are situated lone barns, in which the corn gathered from the neighbouring fields is stacked. Rats have been frequently met in colonies by shepherds at early morning, marching in long lines direct from one barn to another. They have been watched and seen to go direct across country in a straight line. They generally leave one barn for another, when the wheat has been threshed out and their food thus taken from them. But the curious point is

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how they know where to go; how do they find out where there is a barn containing food for them? do they send out scouts, or does their instinct guide them? I believe it is the same marvellous instinct that guides the hungry rats, as that which guides the swallow in her long and wearisome journey to warmer climates, or impels the shoals of herrings and sprats to visit our shores.

A medical gentleman, who lived in the neighbourhood of these downs, tells me that on one occasion preparations were made to ferret and destroy all the rats in a barn near Weston. The next morning the company came—ferrets, dogs, big sticks, and all—but not a rat could be found. In vain the ferrets poked in and out of the holes; in vain the dogs routed under the straw; in vain the men brandished their sticks; the rats were all gone, not one solitary individual remained. We can but conclude that, from former experience, some of the patriarchs among the rats, observing the preparations made, had advised a general change of quarters, and their advice had been taken by the whole colony. Curiously enough, my friend afterwards ascertained from a labourer that he had met a regiment of rats very early in the morning of the day the hunt was to have taken place in the Weston barn, marching along Chilton bottom towards another barn situated some distance away. Some years ago a gentleman driving in a gig, about three o'clock one fine summer's morning, met, upon Kingston Bridge, a colony of rats on the march. He pulled up, and the rats fled off to the right and left, taking not the least notice of either him or the gig.

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A friend who has travelled much, tells me that when off the Cape of Good Hope a heavy sea struck the ship he was in, and lifting up the long-boat from her lashings, knocked her against the bulwarks, and made a great hole in her side. This long-boat was the receptacle for all sorts of lumber, and had been taken possession of by a colony of rats. At the moment of concussion, the rats retired into the innermost crevices of the lumber. As the boat was now of no further use, it was determined that she should be thrown overboard; tackle was therefore fitted, and she was hoisted up, and dropped plump into the raging sea. The scene of confusion amongst the rats, who discovered too late their fate to be committed to the deep, was indescribable. The carpenter had bored a hole in the bottom of the boat, as sailors do not like that anything they throw overboard should be picked up; and as the boat began to fill, the rats came nearer and nearer to the surface of the sea, till at last they were entirely deserted by their faithless boat, and obliged to swim about, as best they might; but this did not last long, a heavy sea was on, and a great wave came thundering along; the half-drowned rats were borne to the top of it, and then were lost in the watery valley the other side.

There is a third kind of rat, which is very generally distributed throughout England, whose personal appearance is well known to most anglers; it is the "water-rat," or, as it is sometimes called, the "water-vole." This little animal may be considered as the representative of the beaver (many years extinct) in the British Isles. He is entirely

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aquatic in his habits, and is never seen except by the water-side. Upon examining his anatomy we shall find that he, too, is constructed with reference to the mode of life he is destined to follow. His neck is very short, his head rounded and convex above, to enable him to swim fast through the water. His fur is almost waterproof, being composed of two sets of hairs, some long and projecting, others short and thickly set, together forming a close silky pile, which effectually resists the entrance of the water, and serves its owner in the place of a very warm, waterproof greatcoat. I have often seen the water-rat swimming under water, and have frequently observed that he appears to be surrounded by a case of air, in fact, looks like a large air-bubble swimming along. This effect is produced, I imagine, by means of the first set of hairs above mentioned. The air which he takes down with him on plunging in, would naturally escape were it not that it is delayed by adhering to these long *quasi* reservoirs, and thus renders the whole body more buoyant than it otherwise would be. The tail in the house-rat, as we have above mentioned, serves as an organ of balancing and prehension; in the water-rat it is so modified as to become a sort of rudder and paddle; it is much rounder and more taper, being slightly compressed towards the tip, to afford as much resistance as possible to the water; acting, in fact, like the broad end of the oar, as used by fishermen in propelling their boat from its stern end.

In the house-rat the ears are long and projecting, so placed as to catch the smallest sound. What

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would be the use of such ears to the water-rat ? they would only be in his way ; accordingly we find the following beautiful modification and adaptation of means to ends. The external ears are short, and rounded, and *entirely concealed in the fur*, overlapped, moreover, externally with extremely soft hairs. The hair of the rat under the microscope is a most beautiful object ; it looks like a number of small kidney-beans placed side by side in a row inside a tube. As though these hairs were not sufficient protection against the entrance of the water, the meatus, or aperture of the ear, is capable of being closed up entirely by a thin angular operculum. This admirably-designed curtain the rat is enabled, when he plunges below the water, entirely to draw across the passage of the ear, and completely exclude the element in which he swims.

The water-rat never comes near the abode of men, water-mills excepted ; he prefers living by the sides of canals and ponds, and in the water-meadows, forming a secure retreat for himself in the banks in case of need. The holes and tortuous burrows he excavates are, beyond description, complicated. Frequently a large portion of the bank by the side of the river Itchen, in Hampshire, has given way under my feet, completely undermined by the rats. In this way much damage is done to the dams and banks, on whose security and firmness much valuable property depends. Aware that he has many enemies, and that flight is his only chance for life, the water-rat has not made a "single" entrance to his spacious habitation, but, being amphibious, finds it positively

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necessary to have two portals, one under water, the other by the side of the bank, or on the top of the bank, and on this account it is very difficult indeed to catch him.

The water-rats are nocturnal in their habits, and prefer coming out at night for their food, which is entirely vegetable. They are, however, often tempted out on a fine day, and I have watched them for hours feeding on a large patch of floating weed on the river Itchen, near a place well known to Wykehamists as the "Waterman's hut," and most amusing were their gambols and petty disputes about some dainty morsel of cabbage or potato-skin. I had some difficulty in obtaining water-rats for dissection from Islip, near Oxford; Mr. Blick, my friend, who resides there, informing me that the man who leases the river thereabouts destroys all the water-rats he can, as they eat up his young osiers, which he sells to make baskets, etc.

A Wykehamist friend ascertained most practically that the water-rat was a nocturnal animal. He was out late one night fishing for trout—for the largest fish always feed at that time—and had cast his line across the river. In a few moments he felt a tug and a jerk, as though the fly had been taken by a large fish; accordingly he played his line in the most scientific and judicious manner, and had unwonted sport with his supposed five-pound trout. He landed it, and put down his hand to grasp it: instead, however, of encountering the scales of a fish, he received a severe bite on the fingers. Certain, from this proof, that if it were a fish it must be of a very extraordinary breed, he dropped the net,

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and ran off to the "Waterman's hut" for a lantern. On returning to examine his capture, he found coiled up in a most dreadful tangle of his best silk-worm gut, and his best-made flies, a large water-rat. The rat must have been unsuspectingly swimming along, when the line happened to drop directly over him. One of the hooks had caught in his fur, and had given a jerk to the rod, which the fisherman had mistaken for a trout rising, and had naturally struck the supposed fish, thereby firmly fixing the sharp-pointed hook into the body of the unfortunate rat, who must have been greatly surprised at being so suddenly and unceremoniously dragged to the shore.

FISH AND FISHING

THE cold winter months have arrived; yet we have been out fishing on the days apparently the most favourable for sport, though without much success. The fish have retired into winter quarters among the reeds and mud, so we content ourselves with recollections of past sport, and dip our pen into the inkstand instead of our hook into the Thames.

We well remember, one fine day in August last, going out on a gudgeon-fishing expedition. A luxurious dog-cart carried us quickly to Surley Hall, well known to Etonians. There we found the Charon¹ of this part of the river, Finmore by name, waiting for us in his punt. This old man's

¹ The ferryman of Greek myth, who conveyed the dead over the river Styx, which separated the earth from the abode of departed souls.

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family has had the fishing of the water for more than a hundred years; and the old man himself knows every hole and patch of weeds in the river just about Windsor as well as a Londoner does the shops of Regent Street.

In the punt were placed three chairs and three fishing-rods, two punt-poles with sharp iron spikes on their ends, called in these parts "rypecks": why or wherefore they have received this name we cannot ascertain; lastly, an enormous iron rake. Three anglers occupied the three chairs; two of them were great salmon-fishers, who, but a few weeks ago, thought a fish under twenty pounds nothing: they were now pleased by catching a little gudgeon not a quarter of an ounce in weight. The laziness of gudgeon-fishing is indeed laziness. "If" (as was most aptly remarked at the time) "you exert yourself in the least, the whole thing is spoilt." It is quite contrary to the rules to put on one's own bait, to alter one's own float, to take the captured fish off the hook: all is done by Charon, who not unfrequently has quite enough to do.

Everything prepared, the boat is pushed out into the middle of the river, the two rypecks are fixed firmly into the ground at the bottom, and the boat is fastened to them across the stream. The first operation is to rake up the bottom well with the big rake. Immediately this is done, all the gudgeon in the neighbourhood flock to the place, and if they are in a biting humour, begin instantly to be caught. Bold biters are these gudgeon: they take the hook with a rush, and down goes the float deep into the water. This is capital fun when the fish

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are on the feed : so pleased, indeed, was one of the salmon-fishers aforesaid, that he exclaimed, " Well, there are only two kinds of fishing, salmon fishing and gudgeon fishing," a dictum worthy of the respected speaker.

When we first went out, not a fish could we catch, though we knew there were plenty close under the punt. The reason was that we had not got the hook at the proper depth ; it ought to be an inch, or rather less, from the bottom ; if it is more, the fish, who feed only at the bottom, don't see it, and it passes over them untouched. Gudgeon are curious fish as regards biting ; some days they will bite furiously, another day they won't look at the bait. Even when they are biting well, they will suddenly leave off. The remedy then is to " scratch their backs," as Charon says, " with the rake." This will often make them begin again. We have been out and caught eight or ten fish in one day, and a few days afterwards, with two rods in the same place, we catch fifteen dozen—the best day's sport we ever had. Much, however, depends on the bait ; worms, we find, are decidedly the best. They will be taken by the fish better if they are kept in moss a day or two beforehand, than if used directly they are dug up. We have found that a little cream poured on the moss causes the fish to bite at them with eagerness ; the reason probably is, that the worms feed on the cream and thereby acquire a fine transparent look. Something, too, depends on the line : this must not be too thick, nor of a colour easily seen in the water. The finest line that can be used is made of human hair ; it is much finer and

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much stronger than gut made from silk-worms; but it must be made by the fisherman himself; it cannot be bought anywhere that we know of.

I learnt casually that some anglers, who are very fastidious about their lines, prefer above all things hairs out of the tails of the Queen's cream-coloured horses; but as the tails of these horses seemed in pretty good condition the last time I saw them, I imagine the favour of pulling them is granted only to a few.

When the gudgeon are caught, they are placed in the well of the boat, which communicates with the water outside by means of an open grating. The fish seem to know they are captives, for they all crowd to the grating when one attempts to take them out of the well. I have also observed, about all the kinds of fresh-water fish that I have caught, that they will, when placed on the bank, always jump towards the water. I once saw a fine barbel, that was covered with grass by the water-side and thought to be quite defunct, suddenly begin a series of jumpings towards the river; and a fine race I had to prevent his getting back again into the hole whence he had just been taken. How is this to be accounted for? I have placed a fish where he can neither see nor hear the water, even supposing that he has the power of seeing and hearing when out of his own element; yet he has always jumped in the proper direction towards it.

When the water is low and there is no wind the marks of the gudgeons' snouts can be seen on the mud by the sides of the river, or even in the centre of the river if the water is low enough. These

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gudgeon-tracks are interesting to the geologist, for they might afford a key to many marks found in a fossil state in several districts of England. Witness the block of stone in the British Museum, showing the marks of the retiring tide and the indentations of the rain which 'must have been falling at the same time. If an antediluvian gudgeon had been grubbing on this stone, I trow his marks wou'd have puzzled many of the learned.

Upon the mud in shallow pools, curious marks can often be observed, as if a person had been drawing patterns on it with a small stick. These are the tracks of the common caddis-worm, that curious worm which forms for its unprotected body a covering of sticks, small stones, and even shells, which house it carries about on its back; it is these houses that make the grooved marks in the mud.

It would appear that fish have the power of altering their colour, so as to resemble the colour of the water in which they have been confined: this is the case particularly with minnows, sticklebacks, and trout. Mr. Grove, the fishmonger at Charing Cross, will tell you where a trout comes from, by his colour. The trout which live in peat-coloured water are sometimes nearly black; those from fine running streams, such as the clear chalk streams about Winchester, are of a beautiful silvery colour. Gudgeons placed in a glass bowl will become very white, and lose the beautiful brown colour on their backs. Not long ago, I observed some very pale, woe-begone carp in the tanks of the Regent's Park Gardens. I remarked

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to my companion that I was sure, from their pale colour, they had been in captivity somewhere. The keeper soon afterwards told me that they had been presented by Mr. Albert Smith, who had had them in his artificial pond, in the Egyptian Hall, for many weeks : the poor fish had been all this while living in gas-light. I am anxious to see if they will recover their colours : they probably will in course of time.

In a cheesemonger's shop, in Tottenham Court Road, is a large glass bowl full of gold-fish : these fish look ghastly pale and white, poor things ! They cannot help so doing, for their transparent habitation is fixed on a stand which is painted dead white, and they sympathise with the colour. In the same street, a fishmonger has a vivarium, but he wisely has placed in it several of those beautiful Venus-ear shells that exhibit such wonderful iridescent colours : the fish have benefited by this, and they look as well again as the cheesemonger's fish. A fishmonger at Billingsgate Market told me he generally knew from what part of the coast fish came by the colour of them. This observation was apropos to a quantity of Dutch Jack that were displayed on his slab ; and which looked very dingy and dark-coloured, as though they had lived in stagnant and dirty water ; very different from a clean and bright-coloured Thames Jack. Dutch Jack never look to me the same fish as the English Jack : there is no real difference, I believe. The fishmonger said there was about as much difference as there is between an Englishman and a Dutchman. Some of the trout in Scotland, which live

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in water discoloured by the peat, become quite black, but they do not appear to be the worse as regards eating. In some of the Scotch lakes, I understand, trout of two kinds are found, viz., the original inhabitants of the lake, which are of a bright, fresh colour, and also black-looking fish which have come down the streams into the lake.

Mr. Quekett also tells me that in these Scotch lakes the trout which live in the deep water in the centre of the lake are of a dark colour, and those which are found along the shallow margins are of a bright colour. The reason of this probably is, that the fish near the margin receive more light—both that which comes directly through the water and that which is reflected from the stony bottom—than those which live in the deeper parts of the stream.

Sticklebacks are wonderful fish to change their colour. I have seen sticklebacks at the tail of a mill-pond at Islip, of the most beautiful iridescent colour: the bottom was composed of clean white gravel stones. Again, there is a ditch running round Christ Church meadow, at Oxford: there the water is black and dirty, and the sticklebacks are of a brown and almost black colour. It is in this family of sticklebacks that we find an instance of a fish making a nest. At first this sounds curious, “fish’s nest” being in the same category as “a mare’s nest”; but I do not see anything contrary to reason in it, as the idea of a nest is usually associated with eggs, and everybody has heard of fishes’ eggs or spawn. The fifteen-spined stickleback is known to build its nest along our shores; it is a sea-fish.



STICKLE BACK AND NEST

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Mr. Peach, a great observer, wrote to my father on this subject in 1845, as follows: "Mr. Crouch, of Penzance, was the first that I heard of noticing a fish's nest, and it was that of the fifteen-spined stickleback: he has paid great attention to the habits of this fish. It is a most determined warrior, and will give battle to a fish of much greater size than itself: they are plentiful in this harbour." (Fowey in Cornwall.)

I am aware that the fresh-water stickleback, so common in our ponds and ditches, makes a nest like his salt-water relation. I have never been lucky enough to find one.

Mr. Albany Hancock has, however, recorded in the *Magazine of Natural History*, 1852, many interesting observations on this curious subject; and as he himself watched the whole process, I take the liberty of inserting an abstract of his observations: "I had the pleasure of seeing the nest built from the very commencement, and through all its stages. The place selected for the nest was the bare, flat top of a piece of oolite, where it formed a right angle, by resting against the glass partition which separated two ponds (in a tank), in one of which were kept four minnows and two small eels, and in the second the sticklebacks. Now he (the male fish) arrives with a large fibre in his mouth, deposits it, re-arranges the whole of the materials, already accumulated, with his mouth; removing one fibre to this place, and another to that, and departs in his search for more. Now he returns, carrying a small piece of gravel, which is carefully placed on part of the fibres, as

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it were, to keep them down; he then draws himself slowly over the whole, and is off again. Now he brings another fibre, which he dibs in with his snout, so as to make it interlace with the others. Now he is busy poking a circular hole in the middle of the accumulated materials with his snout; thus he conveys, without cessation, decayed rootlets, gravel, sand, and whatever he can find that will answer his purpose.

“ But I must observe that the specific gravity of his materials is continually tested; for, having found what appears a suitable fibre, it is carried a little way, then projected to a short distance from his mouth, and watched as it falls; if it falls rapidly, it is tried again in the same manner; and if it then proves too light, it is abandoned altogether, and another selected. If there should be any strong fibre, which he has a difficulty in causing to remain in the position he requires, a small quantity of sand is brought in his mouth, and adroitly placed on the top of the fibre to keep it down: if this does not effect the purpose so as to please him, the refractory piece is taken out, and rejected altogether. At the same time he hangs or hovers close over the surface of the nest, and throws his whole body into a curious and rapid vibratory motion, by which he causes a rapid current of water to be projected on the materials as though to prove their stability; and when this operation is performed, the lighter particles and light mud, as it were, fanned or winnowed out by the generated current may be seen floating away. Another very curious operation is the action of drawing his body

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slowly over the surface of the materials which form the nest. I believe that at the time he excretes a glutinous matter, which acts as a species of cement, and tends to keep the materials together. The whole time occupied in accumulating the materials for the nest was about four hours, during which interval a goodly quantity had been obtained."

But lately I made an expedition to the Isle of Dogs, opposite Greenwich. I found (end of July) thousands of young sticklebacks in the shallow ditches which intersect the island. They were all very minute; only two full-grown sticklebacks did I see all day. One was dead, and the other was very nearly dead. Query, what becomes of all the full-grown fish? The waterman who pulled me across the river said that shoals of sticklebacks come sometimes to the landing-steps, close by where the steamers stop; he thinks they are washed out of the ditches of the Isle of Dogs opposite. I did not see any when I was there, but the water was very muddy, and the wind was blowing.

The male stickleback, in the breeding season, is really a most beautiful little fish. His skin is quite iridescent, with magnificent red and green colours blended together. These colours, as is the case with most fish, are very evanescent, and soon fade away after the animal's death. The best way I know of to preserve them is to skin the fish, as soon as they are taken out of the water, varnish them carefully directly the skin is dry enough to receive it, and hang them up to dry, *in the dark*. I never yet saw a stuffed fish in a fishing-tackle shop or elsewhere that had not lost its colours. If

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these fish had been dried in the dark the colours would have remained much more perfect. This rule will apply to the skins of snakes and lizards as well as to fish.

In our gudgeon-fishing expeditions I often observed large islands of rushes, of which Charon seemed very careful, not allowing the punt to break or otherwise injure them. These rushes are valuable for two things: firstly, they are sold to make chairs and baskets; secondly, they harbour the jack, which the knowing Charon catches. A few days ago I saw a man making chairs with this sort of rushes; he informed me that he bought them at Maidenhead, and that they were very dear, as he had to give four shillings "a bolt" for them, a bolt being about as much as he could grasp with both arms.

In these rushes, too, the otters live. I much doubted their existence so near London, till I saw their spoor or foot-marks under the high muddy banks; and having taken the impression of a dead otter's foot in clay, I know it again when I see it. Charon says, when he is out in the grey of the morning, taking up his nets, he hears them barking and calling to one another. On cross-examination, he "supposes" there must be *twenty* otters between Windsor and Maidenhead. If they exist, they must be very wary animals, and don't often show.

A famous hiding-place are these rush islands for the jack; as many as twenty-six jack have been caught in a net in one day, and some of them fine fish; but the king of the jacks was caught in the autumn of 1855 at the first lock above Windsor.

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Charon informed us that he had "been after him" many days. A big fish has as much chance of escaping our friend as a noted pickpocket of escaping the detectives at Jullien's concerts. At last the big jack was marked down behind the lock-gate, and was immediately captured. When in the net, he made no resistance at all, but lazily gave up the ghost at the bottom of the punt; and so proud was Charon of him, that "he sat up all night" watching his body; why or wherefore we can't conjecture, except that he was looking forward to getting a guinea for him in the morning. This immense fish was in beautiful condition; he weighed upwards of thirty pounds, and had a barbel three pounds weight in his stomach. He was caught a few days after a flood, when the water was beginning to run off. It is therefore probable that he escaped out of some pond higher up the river and swam downwards in search of adventures, which adventures turned out unfortunately for him. Charon is also of this opinion; for had he been a river fish, he says, he would have had his wife near him, as jack generally live in pairs. Nets and divers devices were put into requisition to catch the female fish; but she, like a wise fish, had remained at home to be "preserved" in water, not, like her husband, to be "preserved" in a glass case in varnish.

But this is not the only large fish Charon ever caught; it was he who captured the last salmon ever seen in the Thames above London. Forty years have passed since the last of his species, in the Thames, became a victim to the cupidity of

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man. This poor fish had a favourite hole near Surley Hall, which was at last found out, and his destruction determined upon. Accordingly one day the hole was surrounded with nets on every side, and the fishermen made sure of their prey; but they were mistaken. The salmon discovered suddenly that there was treachery, and, like a brave and wise fish, he made a jump, not into the net,—he was too knowing for that,—but right over it, escaping triumphant, for a time at least.

Some days afterwards he returned home to his hole; the nets were again put round him; but this time, on to the cork lines of the nets which were in the water, was fastened a net, which remained suspended in the air by a string. Again the salmon made a rush and a jump; he got well over the net in the water, but fell, of course, into the net suspended in the air. He died an inglorious death, but his remains were honoured by becoming “a dainty dish to set before a King;” for he was taken to the King, then residing at Virginia Water, who gave the lucky netter a guinea a pound for his fish: twenty guineas for a few hours’ work! But, alas! salmon in the Thames are now as extinct as Dodos in the Mauritius. It is Charon’s opinion that the salmon are kept away from the Thames, not by the steamers or by the sewage matter in the water, but by the drainage from the gas-works. He gave his reasons at the time he told us this, and we were persuaded to back his theory.

Not many years ago there came a great flood, and this flood had no respect for the royal fish-ponds, but flooded them also. We understand that

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when the water subsided very many fine specimens of fish were caught in the Thames by our friend Charon : these fish had escaped from the royal preserves, never again to return there. A somewhat similar instance has occurred at Oxford, where, within the last two years, great numbers of Prussian carp have been caught, where no carp were caught before. I understand that the original stock came from a gentleman's pond, and the fish got out in the flood time. That terrible weed which has done so much harm in Cambridgeshire has got up to Oxford, and is filling up the ditches in Christ Church meadow, and the shallow water where the boats are stationed, very fast ; we wonder swans are not turned down to eat it, for they thrive upon it.

Among thick banks of weeds in shallow places, in the neighbourhood of deep water, the jack delights to bask—a fatal habit for him : many a jack have I wired in the neighbourhood of Oxford when basking in this way. On watching a jack in a vivarium I remarked a curious provision given him, to enable him to thrive well in this stagnant water. All fish breathe by means of their gills. The little red slips we see forming the gills contain blood-vessels, and the blood becomes aerated by means of these quasi lungs being waved backwards and forwards in the water. A fish, like a man, requires a perpetual supply of air to his breathing apparatus, whether that be gills or lungs. A fish gets his air from the water, a man gets it from the atmosphere around him. Reverse the position of the fish and the man, and the former becomes what

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is called "drowned" in the open air, the man is "drowned" in the water. In both cases the air cannot get to the breathing apparatus; in the case of the man because the water intervenes, in the case of the fish because the numerous little blood-containing filaments which compose the gills become stuck together, and of course cannot act. This is the meaning of the violent gasping of the fish when taken out of water : it is endeavouring to separate the gill filaments, but cannot do so without the intervention of water.

Now the jack living in a favourite stagnant shallow requires water to be brought perpetually to its gills. The water does not come of itself, so the fish, I have observed, keeps continually moving the two fins nearest its gills, to create a perpetual change in the water, propelling that which has already passed through the gills, and bringing fresh in its place. We see in this provision an admirable instance of the foresight and benevolence of the great Creator, ever adapting the structure and habits of the creature to the locality intended for it to occupy. Again, to go back to the common stickleback for an instant : this little fish living in shallow stagnant water, by means of a continuous motion of its pectoral fins keeps up a current of fluid towards its gills. Neither to the jack nor the stickleback does the motion appear to cause any exertion : it seems natural to them, and a distinct function apart from the motion of the fins for swimming purposes. It is somewhat analogous to the perpetual motion of the heart, lungs, and internal viscera in our own bodies. All this is

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accomplished by a set of nerves,—the sympathetic, —over which we have no control. It is no exertion to us to keep our hearts or lungs moving, they are not subject to our will, but sympathize with the emotions of the body.

Another kind of fish common about Windsor is the roach, and these will bite well in the winter time; but they are most uncertain feeders. Some days they will bite as fast as the hook is put in; another day, the weather the same, the wind the same, the water the same, and not a bite will the angler get.

These fish run from two ounces to a pound in weight; and capital sport they give. Being delicate biters, a very small hook must be used, a line of the finest silk-worm gut, and a small porcupine-quill float. An inexperienced hand will hardly ever catch fish the first time he goes out; for if he expects to see his float suddenly disappear, he will be disappointed; a slight jogging of the float is all he will see. Let him strike quick and sharp, for Mr. Roach has a very small mouth, with no teeth in it, so that he sucks in the bait with his prehensile lips. If we examine the lips of fish, we shall find another proof, were it required, of beauty and design, everywhere apparent in the works of the Omniscient Creator. The roach lives principally upon small insects and spawn of fresh-water mollusca, which he finds adhering to the weeds. Unless he had these prehensile lips, how would he manage to get his dinner? Again, examine the mouth of a sprat (an uncooked one, mind); it looks a little tiny mouth, not large enough

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to admit a pin's head; but just push down the lower jaw, and what will you see? Why, one of the most beautiful insect nets that it is possible to conceive; a net into which you can get the top of your little finger, and, of necessity, terribly destructive among the minute sea creatures which the sprat feeds on: those pretty little animals which cause the sea to be luminous at night forming, doubtless, part of the bill of fare.

Lately, when going over to Guernsey in the steamboat, the captain was feeding the gulls, which followed the boat, with sprats, of which there were many baskets full on board. Sending coals to Newcastle, thought I; but I soon learned there were no sprats caught near the Channel Islands. I showed the captain the mechanism of the sprat's mouth, and he informed me that, when opened, it much resembled the net used by fishermen in catching the sprat itself; so that the fish has furnished his captor with a pattern for an instrument to work out its destruction.

On my return from Guernsey, I determined to try to catch one of these gulls. I accordingly procured a very long fishing-line, and some fine hooks, tied to common gut; on these hooks I placed bits of fish, and cast my line behind the steamer. It was quite wonderful how soon a gull would see the bait, and dart at it. But, alas! I never got a single bite at my hook; the birds were too sharp-sighted; in every instance just as the gull was about to seize the hook, he suddenly turned aside as if suspecting that all was not right: and, although hovering over the tempting morsel for many

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minutes, his quick eye detected the thin gut or the string, and wisely he did not try the experiment, but left the bit of fish to jump up and down in the steamer's wake, and myself at the other end of the string, looking foolish, and well exemplifying Johnson's definition of an angler—a worm at one end and a fool at the other. What made me more angry was that the gulls would pick up instantly any bit of fish that was thrown out without a hook, however small it was. How keen must be the sight of these birds to discern a bit of fish not so big as a shilling, in the frothy sea, at the wake of the steamer!

How, again, did these beautiful birds manage to keep up with the vessel, which was going pretty fast through the water? They never seemed to move their wings as in flight, but simply to glide onwards, as though attracted to the ship's stern by some magnetic power. Let the reader examine the pectoral or breast muscles of the gull, he will find them one solid mass of firm hard muscle admirably adapted to sustain and work the wings. What models of beauty and lightness are the wings of the gull! The bones are composed of the hardest possible kind of bone material arranged in a tubular form, combining the greatest possible strength with the greatest possible lightness. If we make a section of the wing bone of a gull, or, better still, of that of an albatross, we shall find that it is a hollow cylinder like a wheat straw; but in order to give it still further strength, we see many little pillars of bone about the thickness of a needle extending across from side to side: these buttress-

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like pillars are in themselves very strong, and do not break easily under the finger. Again, at the top of the bone we find two or three holes which communicate with the interior: through these, when the bird is alive, pass tubes which are connected with the lungs; so that when the bird starts for a flight, he fills his wings and other bones with air, causing them to act somewhat like a balloon on each side of him. This explains one of the chief reasons why man will never be able to fly; his arm bones are filled with marrow of which he cannot by any means get rid, should he be ever so anxious to fly like a bird.

The gannet or solan goose is a bird that seems perfectly indifferent to stormy weather and to cold; if any bird is abroad battling with the elements it is the gannet. This is by some considered as a sign of courage on the part of the bird, but it is not so much pluck as confidence in its powers. The air-cells which give lightness to its body are developed in an extraordinary degree, so much so that Mr. G. Montagu writes (1808): "The gannet is capable of containing about three full inspirations of my lungs, divided into nearly three equal portions, the cellular parts under the skin on each side holding nearly as much as the cavity of the body." Now, as a full or extraordinary expiration of the human lungs had been considered to occupy a space of about sixty cubic inches, so the gannet is capable of containing not less than 180 cubic inches of air at one time, subject to its will. And it must be recollected that the gannet is not a very large bird, to contain all this air.

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This bird is accustomed to dart suddenly down from a considerable height upon the fish which it sees on the surface of the water : its air-padded skin and body lessens the concussion, and prevents its being dashed to pieces. Again, nothing could possibly conduce more to its security against intense cold, or be better adapted to preserve its animal heat, than this intermediate space of air between the skin and the body—on the same principle that we sometimes put double windows to our house in very cold weather. The Russians, I hear, have their panes of glass sometimes three or four double, with an interspace between each pane, to keep out the cold, so intense in northern latitudes.

I had brought a fish with me, when gull-fishing from the steamer, to cut up for bait for the gulls : it was of the species called rock fish, its habitat being among the rocks. Upon examining the head of this fish, I found that it had a beautiful contrivance in the conformation of its mouth. Its food consists of small shell-fish, spawn of shells, etc., which adhere firmly to the rock : now how was the fish to pull these off ? In the anterior part of the mouth, both in the upper and lower jaw, we find several teeth projecting in a forward direction ; but this is not all : suppose a dainty bit of food is espied snugly concealed deep down in a small hole, how is the fish to get it out ? It has the power of prolongating both its jaws to nearly the extent of half an inch from their natural position ; this is done by a most beautiful bit of mechanism, somewhat on the principle of what are called “ lazy

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tongs." When the jaw is in a natural position, the mouth looks not unlike the mouth of an ordinary fish; but pull the teeth, and out will come half an inch of retractile jaws. Thus this fish is fully equipped with a contrivance, by means of which he obtains his daily food. Who can look at this without seeing in it a proof of an omniscient and kind Creator?

Take, again, another form of mouth in the fish tribe—the common gurnard. This fish lives at the bottom of the water, and hunts about among the sand and mud for its food. To enable him to do this, the bones of the head are composed of a bone-like material, like the skin of a sturgeon, and not of a soft substance like the head of a mackerel. These bones end in a shovel-shaped projection, almost amounting to a snout, at the top of which there are eight very hard bony pegs. With this snout he probably pokes about among the mud, and stirs up the animals he feeds on, which he then easily catches with his capacious mouth. He has also three things like fingers on each side of his head, which probably assist him to feel about, for he lives in very deep water, where there cannot be much light. The position of his eyes tells us this also, for they are placed quite at the top of his head, and in an upward direction, so as to catch every ray of light coming from above.

The only fish that is, so to speak, domesticated—viz. the gold-fish—is a capital example of an infusorial feeder. These poor things when kept in glass globes, live apparently upon nothing. Give them, however, fresh water frequently and they

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will get fat—that is, as fat as fish ever will get. The bits of bread thrown in they seldom eat. Upon what, then, do they thrive? Why, upon the small, invisible animals that abound in the water. If the exuviae of these fish be examined with a microscope, the flinty skeletons of these said small, invisible animals will be seen in abundance, their bodies having been digested by their devourer, the gold-fish. We can no more deny that the fish has fed upon infusoria, under these circumstances, than we can deny that an owl has eaten a rat when we pick up the rat's skeleton and fur matted together, as ejected from the crop of this benefactor to the farmer.

I once lost a pet hedgehog. High and low I hunted for it, but nowhere was it found. The next day, when going to feed an eagle I kept tied up in the garden, I found a large ball underneath his perch, which turned out to be composed of poor hedgehog's bristles, bones, and skin. The unsuspecting brute had gone out at night into the garden to look for slugs and beetles, but had unluckily come across the eagle, who had made mince-meat of him, though it is still a puzzle to me why the hedgehog's sharp bristles did not stick in the eagle's throat and choke him.

I was informed by a man, who wanted to sell me five gold-fish, and the bowl in which they were, for ten shillings, that the fish he buys are bred by a gentleman near Amsterdam, and sent over by hundreds, in zinc tanks, on board the Dutch eel-boats. From another source, I learn that there is a breeding-pond near or at Bradford, in Yorkshire,

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and the fish are sent up thence by rail to London. Gold-fish are said to have been originally confined to a lake near the mountain Tsien-tsing, in China. They were first brought to Europe in the seventeenth century, and continued very rare in England till the year 1728, when a fresh accession was received.

When they were cleaning out the basins of the fountains at Charing-cross, I asked the foreman if he ever found any fish at the bottom, when the water had been drawn off. He told me that sometimes gold-fish were found, and that he imagined they got there out of the glass globes of the men who go about the streets selling gold-fish, and who come to the Charing-cross fountains to change the water. During this operation, a gold-fish or two might easily escape; or, if the glass bowl got broken (they are not made of very thick glass) against the side of the basin the pool would at once become well stocked.

Some four years ago, I bought in Hungerford-market a quantity of small eels, and taking them home, placed them in a large tub; but they did not thrive, so I tied them up in a handkerchief, and transferred them to the Charing-cross basins. I heard no more of them till a friend told me of a paragraph he had seen in a newspaper, stating that some good-sized eels had been found in the basins at Charing-cross; and that the newspaper correspondent accounted for their presence by supposing "that they had escaped from the fishmongers' shops at Hungerford-market, and had gone to the nearest water by instinct." Now, in the first place, this

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is not the nearest water; the Thames is nearer to the market than Charing-cross. Next, imagine an eel escaping from a fishmonger's, crossing over the crowded Strand, and climbing up the sides of the stone basins to get into the water! I know that eels will travel from place to place; but I much doubt their ever taking such a journey as attributed to them by the newspaper correspondent, who needed not to have resorted to such an ingenious, but impossible theory, had he seen me put the eels into the basins some months before.

In the fountain in the Temple Gardens, eels are frequently found. The water comes from the New River, and it is quite probable that they get into the pipes when quite small, and afterwards grow in the fountain. Mr. Quekett had an eel some years since that stopped up a water-pipe leading to a fishmonger's shop in Clare-market. The pipe was taken up, and examined, and in it was found a *blind eel* nearly two pounds weight. The largest eel I ever saw was found dead in a pond at Mr. Drury's house, at Shotover, near Oxford. It was supposed to have died of old age, for no marks of injury were found on it. It is now preserved in the Ashmolean Museum. I understand, from a friend just returned from New Zealand, that enormous eels are found in the rivers there, larger than any he ever saw in England.

It is well known that eels are very sensitive to changes in the weather; and they are generally on the move when thunder is about, or, in other words, when the atmosphere is charged with electricity. This fact is curious, in connection

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with the so-called electrical eel, which seems to have a store of bottled electricity always ready for use. Eels, too, are much affected by frost. On this subject I learn from my friend Mr. Turner, of St. Leonard's, who, in his capacity of surgeon on board ships going to and from India, has made many curious and good observations in natural history, that, in the months of January and February, 1855, the conger-eels, in the sea opposite St. Leonard's, were affected by the frost in a most remarkable manner. He writes to me :—

“During the intense cold (Jan. 1855), some few miles out at sea, *thousands* of conger-eels were found floating on the surface of the water. They could progress readily in any direction, but could not descend, and consequently fell an easy prey, the boatmen catching them by means of hooks on the end of a long stick. In this manner no less than *eighty tons* were captured, of all sizes, some being as much as six feet long, and of a surprising circumference. The greater part of them were sent to London per rail. One of them I opened, and found the air-vessel distended with air to the utmost, so as to completely close the valvular opening. It was this, evidently, that buoyed them up. No other fish were observed in the same condition. The thermometer at this time was very low, and one night went down to 16°. On the 17th Feb., I have a note, that as the tide receded, the beach was left as if covered with snow, but on an examination, this appearance was found to be owing to crystals, as if of frozen sea-water.”

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I learn that these congers are eaten in London principally by the Jews, who are very fond of them. The neighbourhood of Petticoat-lane is the great market for them.

The fisherman at Teddington lock, Mr. Kemp, tells me that the Jews, during "their holidays" (I suppose some festival of their church), eat nothing but fish, and at that time they will buy as many barbel as he can catch. Barbel is a coarse-flavoured fish, but the Jews do not seem to mind that. The Jews are the best judges and cooks of fish in the world. I have ascertained that they generally fry them in *boiling* sweet oil.

Fish, in general, are very difficult to transport, but I can readily imagine that a gold-fish would bear a long journey, as they are of the carp tribe, and will exist, and thrive too, in very foul and dirty water : when even taken completely out of water they will live a very long time. The conformation of their gills explains this. The gill filaments do not readily adhere together, and so they continue to breathe if there is any moisture at all left in their gills, whereas most other fish soon get suffocated out of water, as previously explained. I once had a curious confirmation of this fact. I was invited to the clearing out of a pond in the neighbourhood of London, which was full of gold-fish. I arrived late in the day ; the work had been all done, and in an out-house I was shown a common water-cart, such as is used to water the roads, quite full of gold-fish, nearly all of them alive, all quite small, none weighing above three ounces. The owner kindly gave me a dozen, which I placed

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in wet grass, and then in a cloth in a carpet-bag. There the fish remained all night. On my arrival in London, the afternoon of the following day, I placed them in water, and found, to my surprise, that half of them were still alive, having passed a night and half a day in a carpet-bag. Those that were dead, I cooked : they were like carp, and I cannot say good eating. Those that were alive, I transferred to a glass bowl. In a few hours they were well and swimming about, though at first they rolled about in the water as if intoxicated. I was informed that the pond having been cleaned out, the water-cart was wheeled to its margins, and the gold-fish turned in again. Two-thirds of them recovered, and are living in the pond to this day. These fish were taken out of the water on Monday morning early, and remained in the water-cart till Tuesday afternoon ! Who, after this, will doubt the vitality of the gold-fish ?

The Serpentine in London contains some fish, but not many. I see men and boys frequently fishing on the south bank, but they never seem to catch anything except a few roach and bream. It has been said that the reason why fish do not abound in the Serpentine is that the water-fowl eat up the spawn before it has time to hatch, but there does not appear to be a sufficient quantity of birds to do much execution in this way. Ducks are, however, terribly destructive to fish-spawn in some places, as the fish generally place it in the shallows, just where the ducks love to hunt for food. The most probable reason why fish are scarce in "Loch Serpentine," as it has been aptly called, is that the

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water is so very dirty, and charged with decaying animal matter, that they positively cannot live there. This summer I bought three good-sized bream, from a man who had caught them in this dirty pond, and I had them cooked for dinner; they tasted so strongly of the foul mud, that to call them simply "nasty" would be a stretch of politeness.

From the Knightsbridge barrack window I have a capital view of the Serpentine. In April it was of a dark mud colour seen from the distance; about June it assumed a greenish hue; and now (August) it has the same appearance as the sea in a calm. This is due, I imagine, to the hatching of thousands of minute infusoria, and the generation of minute vegetable matter. Both the animals and the plants assimilate and convert into their own forms what would otherwise fly off in the form of gas and miasma, and be injurious to the Londoners who walk on the banks. Thus nature partially works her own cure. In reference to this point, a gentleman who has been much engaged in engineering works in Holland, informs me that the canals and ditches in some of the Dutch towns smell most offensively till the water becomes green, and then the smell disappears: the same thing that happens in the Serpentine happens in Holland. I have lately seen a blue book containing drawings of the little beasts and the vegetable matter from the Serpentine. These little animalculæ are generally looked upon as being the cause of all the foulness of the Serpentine, but the saddle is put on the wrong horse. If these little creatures and plants did not

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come into existence, the miasma from the decaying matter would be insupportable.

Frogs are seldom found in ponds where ducks are kept. The ducks devour the tadpoles, and have no objection to young frogs, even if they have got over the tadpole state. Mr. Quekett tells me, that in the neighbourhood of Willesden there are no wells, and each householder has a pond : these are kept free from newts and frogs by the keeping a jack in them, who eats up every frog and newt that makes its appearance.

I once saw a little boy fishing in the Serpentine with very primitive tackle. All of a sudden there came a tug at his line, nearly pulling the rod out of his hands. He gave a jerk upwards in answer to the unexpected bite, and out came a lively black eel about two pounds in weight. The boy was so frightened at the writhing eel that he put down his rod and ran away, leaving the eel on the grass.

Night lines are forbidden in the Serpentine. We have all seen the pretty little model sailing-boats scudding across the Serpentine, with all their neat white rigging glistening in the sun. Who would imagine that some of these harmless little craft are up to mischief ? I have learnt that towards the close of the evening, when it is getting dusk, a night line is neatly coiled up on the deck of the pigmy frigate, and she is set to sail across. As she sails, the night line pays out, unseen by anybody from her stern. One end of the line is tied to a stone, which is thrown a little way into the water at the moment the ship starts : this acts as a weight to keep the line at the bottom, the other end of the

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line is loose on deck. By the time the frigate nears the opposite shore, all the line has been paid out, and she sails in right under the nose of the park-keeper, with nothing on her deck. She has, nevertheless, been transgressing the laws, though she looks so innocent. In the morning the owner comes and fishes out the stone which he has thrown in with the line attached, and sometimes gets rewarded with an eel for his trouble.

Again, to return to the perch. Its mouth will admit two fingers, also a minnow or a gudgeon, when the perch wishes to catch one. Ask for a perch-hook at the fishing-tackle shop, and you will find you will be presented with a pretty large one.

The best bait for perch is a live minnow; the perch can't resist it; he comes at it with a rush, and is caught by the hook, which is only just run through the upper lip of the minnow. In order, therefore, to be hooked, he must swallow the bait, beginning at the tail end; this his capacious mouth enables him well to do.

I have lately heard of a capital plan to catch perch, and likewise to keep the shoal together while you are pulling out the individual fish. It is to place several live minnows in a decanter of uncut glass, and then sink it, with a string attached, deep into the water. The perch, who can't make out the glass, keep rushing at the encaged minnows, which they cannot, of course, reach; they lose their tempers, and their appetites are sharpened; therefore the more readily do they take the baited and spinning minnow, which you artfully troll close to your decoy bottle.

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A fine perch was found floating dead, on the top of the water in a pond, in one of the gardens at Oxford: upon examination, it was found to be very thin, and apparently starved to death. Some devotee of the "gentle art" had been the unconscious cause of the sad fate of this poor fish; for a hook was found firmly fixed in his upper jaw, the shank of which projected so far beyond his mouth that his efforts to obtain food must have been useless: the hook always projecting forwards, kept him at a tantalizing distance from the desired morsel.

But fishes which, like perch, are provided with sharp prickles, occasionally cause the death of those creatures that feed upon them. A kingfisher was brought to me in the summer of 1848, by a boy who had found it dead on the banks of the river Cherwell, near Oxford. No shot or other marks of injury were found on it, the feathers being perfectly smooth, dry, and unstained. What, then, was the cause of death? Upon a careful examination, I found the end of a small fish's tail protruding from one of the corners of its mouth. I endeavoured to drag it out, but in vain; it was firmly fixed. By dissection, I found that the fish in question was one of the finny tribe which abound in shallow water, and which are called in Oxford the bull's head, or miller's thumb. They have a strong prickle, nearly a quarter of an inch long, with very sharp and firm ends, projecting on each side of the gills. The fish had, in its struggles, protruded its prickles, which, sticking in the enemy's gullet, had effectually stopped up the

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entrance, and pressing on the windpipe caused its death.

Mr. Quekett has observed a case exactly parallel to this. When fishing at Great Marlow, he saw a dab-chick floundering about in the water, as if something was the matter with it. He secured it, and found that it was choking with a miller's thumb in its throat. The bird is now stuffed, and can be seen at the College of Surgeons, with the fish still in the gullet. When the same gentleman was angling for perch in a Scotch lake, he sent a boy for some minnows; the boy brought back sticklebacks. One of these was put on the hook, and a perch was caught; another perch then bit at the hook and carried off the bait, but was not taken. Mr. Quekett afterwards went to another spot, but returning in the evening cast in his line where he had missed the perch. He caught a perch immediately, and, upon examining his mouth, found the stickleback he had lost off his hook some hours before firmly fixed in the perch's throat. The stickleback had erected the spine on his back, which had caught and fixed him firmly in the gullet of his devourer.

An intelligent lady tells me she once had a pet owl. The bird all of a sudden refused its food: it sat upon its perch, and got thinner and thinner every day, and at last it died. The hard horny bill of a chicken was found sticking right across its gullet: thus the poor thing was starved to death.

Should you ever be lucky enough to catch a large jack, mind how you take the hook out of his mouth; for it is lined with a terrible array of long, sharp

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teeth, all set backwards; once inside, it is very difficult to get out again, whether the captured object be a man's finger or a fish. Sharp points have these teeth, as the troller knows well, when he pulls up his bait scored on both sides, after he has had an unsuccessful run. .

The barbel, on the contrary, has not a tooth in his head: his mouth is made for poking about among the stones at the bottom of the river and procuring his prey, which consists of almost anything. He is a regular fresh-water pig, and lives by picking up what he can find, be it animal or be it vegetable: a good big lob-worm, however, he can't resist, as I have discovered to my great delight. The most observant of poets, Hood, has aptly recorded this grubbing propensity of the barbel in the following lines:—

“In they went and hunted about,
Open-mouthed, like chub or trout,
And some with upper lip thrust out,
Like that fish for routing—a barbel.”

When a barbel is hooked, he always endeavours to strike at the line with his tail, to break it. Now if we examine the back fin of the barbel, we shall find that the first ray of it is cut out into deep notches, just like a saw, and I always fancy that the barbel in these struggles is endeavouring to use this saw-like fin. It can be of no use to him, however, as regards severing the line, for the serrations are quite covered by the membrane which envelopes this first ray of the fin, in common with the other rays. The use of it I imagine to be to steady and steer him in the rapid currents and

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mill streams in which he lives. If we move the serrated ray upwards, we find the whole fin follows it, and is kept tense by it; let it go, the fin again sinks down. In the mast of the London barge we find a parallel contrivance; when about to pass under a bridge, the men let down the sail (the fin), which is attached to a strong mast (the serrated ray), and which works from the deck by means of a joint. Having passed under the bridge, the men hoist up the mast, and the sail become tense. This is exactly what the barbel does, only that his sail (as it were) is opposed to water, and not to wind. The barge makes headway by means of this contrivance, so does the barbel. This, again is a pretty instance of adaptation of means to ends.

The boys at Windsor have an ingenious plan of their own to catch barbel: they throw out their line into the stream, generally in a shallow at the tail of a rapid current, and attach it to a strong and flexible twig of willow. They then, having fixed several of these rude kind of rods, retire to a distance, where the fish cannot see them. The moment the fish takes the hook, the top of the twig begins to bend, then they come up and play him. They generally have good sport, as there is no noise and no shadow on the water, and the fish's suspicions are not roused. In France, they fix a fishing-rod which has a little bit of whalebone at the top, with a bell attached; when a fish strikes the bell gives notice.

Most of the codfish sold in London are caught on the Dogger-bank, with line and hook. The dogfish are great plagues to the fishermen, for they

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take the bait intended for the cod, being in themselves worthless, except that an inferior sort of medicinal oil, passed off as "pure cod-liver oil," is made from them. The fishermen's boys, however, take the spines out of their backs, and string them together to make necklaces.

Like the roach, the barbels require an invitation in the shape of ground bait to assemble together : for the barbel, worms and clay mixed are thrown into the place where the angler intends fishing ; for the former, bran and bread, well mixed up with sand, to make it sink, are used. In the summer I had observed by the river's edge several large holes dug in the sides of the bank. They looked like incipient foxes' earths, or gigantic rabbit holes ; yet there were no foxes or rabbits about. These, I have since found out, are made by the good folks who come fishing. They bring the bran and bread in a basket, and mix them up with earth at the nearest point to the place where they are about to commence operations. Once a good place for roach always a good place, is the rule ; and successive generations of anglers coming to the same fishing-holes, have in places made excavations like small stone, or rather earth-quarries. Often I have found out a good roach-hole by observing the excavations for earth close at hand.

These excavations form capital shelters should rain come on. The ancient Britons were in the habit of digging holes like these, not for fishing's sake but for shelter. Not many weeks ago some labourers, when digging gravel at Brighthampton, near Oxford, came across several such excavations :

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they were simply pits dug in the earth, large enough to hold one or two persons. From the sides of each of these pits a certain quantity of earth had been removed, so as to form a seat. They were, in fact, nothing more than what were used by the riflemen before Sevastopol in our day. The ancient Britons made them probably only for shelter. At the bottom of these pits were found a few rude arrow-heads made of flint, and a quantity of bones. I examined these bones, and found them to be of frogs and shrew-mice. I suppose that these creatures fell into the open pits, long after they had ceased to be used by their original makers, and anterior to the time that they were finally filled up. Frogs and mice in their nocturnal peregrinations would very likely fall into such holes, and remain there till they died of starvation.

Since writing the above, I have heard a story from my friend, Mr. Bush, which may account for finding the bones of the frogs and shrew-mice in the same place and under the same circumstances. He was riding home one evening when he heard, by the hedgerow, cries as of an animal in distress : he got off his horse and saw a frog close to a patch of grass, something having got hold of its leg, so that the frog was a captive. He struck with his riding-whip behind the frog, and then found he had killed a shrew-mouse,¹ whose sharp teeth were still firmly embedded in the muscular substance of the frog's leg. Now I do not know whether the fact

¹ A so-called shrew-mouse is not a true mouse, for he has simply insectivorous teeth, somewhat like a hedgehog, and not gnawing teeth, like the common mouse.

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of shrews eating frogs has been observed, but I think this would lead us to imagine that they did. His teeth, though insectivorous, are quite capable of eating flesh if he could get it. I hope shortly to set this at rest by experiment. However, had a deep hole been near the scene of the fight described above, both frog and mouse would have fallen in, and their bones been found together, as in the case of the Brighthampton pits. It is extraordinary how often dead shrew-mice are found about our hedgerows, but rarely are common mice found. This is, I believe, to be put down to the cat. Cottagers' cats are very fond of getting out at night and hunting in the hedgerows: they see the shrew-mouse, also a nocturnal animal, and kill it, but they will not eat it, as it has a peculiarly nasty effluvium about it, which makes it an unpleasant subject for dissection. The cats have found this out also. For the same reason, many cats will not eat rats.

On one occasion, when intently watching my float, I heard an odd sound as of grinding teeth at my back, but did not take much notice of it, being otherwise interested. Soon I turned round for more ground bait: it was nearly all gone; and where? Why, down the throat of a great cow, who, I suppose, must have had a fancy for bran and brown bread. She did not evidently much relish the admixture of sand with the two former ingredients, for she often shook her head, and looked much puzzled, when she found the sand grating harshly on her teeth—a lesson to her never again to eat ground bait, look it ever so tempting.

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Not long ago I was informed, at Andersson's fishing-tackle shop in Long Acre, that a party of fishermen had just arrived from the midland counties to fish for barbel in the Thames, and that these gentlemen had brought with them "a large tea chest" quite full of lob worms. What a sight for a custom-house officer!

Some time ago, during the frosty weather, when the roach were biting freely, I was compelled to buy some "gentles" (Anglicè, maggots): they were very dear and scarce; so I got only 120 for two shillings—a very bad investment; for, two days afterwards, I found that every one of them had most provokingly turned himself into a chrysalis. Having been placed on a table near the fire, they probably imagined, from the warmth, that summer was coming, and that it was high time for them to see about becoming blue-bottle flies. In the chrysalis state they were of course useless, or comparatively so, for fishing.

Some months afterwards, in turning out a cupboard, I again came across this box, and opened it: it was summer-time, and out flew immediately a crowd of great blue-bottles—all that I got for my two shillings.

When the floods are out, it is no use angling for roach, or any other fish in their usual haunts; they go away, as the flood rises, on to the meadows, to pick up worms and insects, and are not to be found at home in their holes. But lately I received a kind invitation to dine, and to fish after dinner. This I gladly accepted, and, after a sumptuous repast, we adjourned to the river, where we found

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a punt waiting, also a man, with an immense casting-net ready on his shoulders. In vain did we cast in the holes—nothing did we catch but a few gudgeons, who were there in winter quarters, little expecting to be disturbed in fifteen-foot water.

But on the flooded meadows, in two-foot water, the catch of roach and bleak was very satisfactory. Cold work it was—out in a punt, on flooded meadows, till nearly midnight—but very pleasant withal. Very many bleak did we catch on this occasion. At Oxford they call these fish “Tailor-Blays;” but by the time they have got so far down the river as Windsor, they have lost one of their names, and are called simply “Tailors.” There is, however, no resemblance in any respect to a tailor that I can see or learn. “Blay,” the great Johnson defines as a “small white river fish, also called a bleak.” Walton calls him the fresh-water sprat, and says he is ever in motion, and is therefore called by some the river swallow. He adds: “His back is of a pleasant, sad, sea-water green; his belly white and shining like the mountain snow.” A very beautiful description this is!—but it is an unfortunate thing for this fish that he is so beautiful. Ever-designing man hunts and entraps him for his scales, wherein constitute his beauty; and what does he do with these scales? Why, he robs the fish to adorn his own species; he makes with them artificial pearls. A Windsor fisherman tells me he recollects the time when men went out poaching bleak all over the river at the dead of night; and many a battle has there been,

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and many a head has been broken, over a bucketful of these fresh-water sprats.

Mr. Yarrell gives more particulars of this curious trade. We read: "On the inner cutaneous surface of the bleak, roach, dace, white-bait, and similar fishes, is found a silvery pigment, producing the lustre which their scales possess. The ornaments manufactured from it bore the name of patent pearls, and their use was universal in the bead trade, being employed in the manufacture of necklaces, ear-drops, etc. So great, formerly, was the demand at particular times, that the price of the quart measure of fish-scales varied from one guinea to five. The Thames fishermen caught the fish, took off the side scales, and threw them immediately into the river again; and it was the custom of hawkers, regularly, before selling any of these fish, to set apart the scales for the bead-makers. The method of obtaining and using the pigment was, first, thoroughly to clean the scales by exposing them to a current of water, and then to soak them for a time; after which, the colouring matter was deposited. When thus procured, small glass tubes were dipped in the pigment and injected into hollow glass beads of various forms and sizes. These were then spread upon sieves, and dried in a current of air. If greater weight and firmness were required, a further injection of wax was practised. Of this pigment the white-bait afford the most delicate and beautiful variety, and used to obtain the highest price. The bleak was next in esteem, and the roach and dace the least valuable. The French were the inventors of the art; and Dr.

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Listre informs us that one artist in Paris, during the course of the winter, used thirty hamperfuls of these bleak scales in this manufacture."

A HAPPY FAMILY

TRUE and genuine felicity is a rare treasure among human beings, and few there are amongst us who really enjoy this blessing. Diverse are the dispositions of members of households, opposite their tastes, different their tempers. Rare indeed is a "Happy Family."

I never met with but *two* in my life. One was on Waterloo Bridge, some years ago; the other in a booth in Windsor onion fair. The origin of Happy Families is, I believe, this. It is recorded in the annals of the parish of Lambeth, that one Charles Garbett, a poor labouring man, had once upon a time a favourite cat; that this cat was robbed of her kittens, and that her maternal affection was so strong that she, in her desolation, took to her affectionate breast a litter of young rats, having either frightened away or else devoured the rightful parent of these poor orphans. She nourished these young rats; she reared them with affection and care till they arrived at rathood.

Here was a fact—a great fact. Charles Garbett was a philosopher in his way; his cat, like Whittington's, was the pioneer to fortune; he seized the idea—he exhibited his cat and rats. He thought, if a cat will make peace with a rat, a hawk will make peace with a pigeon. Then followed a series of experiments, long and tedious, resulting in

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what?—in a fact which we men and women can hardly attain to, viz., a “Happy Family.” The secret of conferring happiness upon families is now in the possession of the son of Charles Garbett; he received it as an heirloom, an hereditary fortune from his father, and for many years he reaped the results of his patient care and observation.

The reader will like to be introduced to this family. The fee of admission is one penny, with privilege to converse with either or all of them. In a large cage, many wires of which are broken (but not by turmoils in the family; oh, dear no!), we see the following.

Imprimis: The self-constituted commanding officer, Jock, the raven,—a fine handsome fellow, with such a glossy black coat, such an eye, such a sharp beak to keep due and proper order. Then we have four monkeys—two cats—four pigeons—three hawks—two ducks—four guinea-pigs—two ferrets—two rabbits—thirteen black and white rats—one cock—two hens—one badger—two kangaroo opossums—one hare—one racoon—(who has seen thirteen years’ service, and who has gone blind), and three dogs—Rose, Tom, and Limpy. These latter are chosen, not for their beauty, nor yet for their ugliness, but for their malformations. Tom has three legs in front (an extra one growing out of his chest), Rose has three legs behind and two in front, and Limpy has but one leg behind, with no trace of a second; she therefore “goes limpy,” as her name implies. The unfortunates have not been in any way mutilated or disfigured; they are all natural cripples, but very good-natured

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cripples withal, with free use of their tails. Query, do the muscles with which a dog wags his tail so freely in welcoming visitors ever get tired ?

It was supper-time when I made my call on "the family ;" there were sundry slop-basins filled with capital bread and milk, placed in the cage; round one basin were sitting three monkeys, the two ferrets, and a guinea-pig, each and every one of them eating for their lives. The "*monkeys' allowance*" in this case was decidedly the best, for the rascals took out first one handful and then another, and thus filled, not only their mouths and stomachs, but also the pocket-like pouches in their cheeks, which were full to distension. *They* lost no time—they were eating and stealing, stealing and eating, as long as there was anything to eat or steal; the poor ferrets could only take single mouthfuls, and their sharp teeth did not seem at all good instruments to pick up soft bread and milk; they reminded me of an Englishman eating rice with Chinese chopsticks. The guinea-pig was not big enough to reach well over the basin, and therefore every now and then tipped it over for his own special benefit. In the rear of this supper-party was the duck, who every now and then, reaching over the whole party, thrust her long neck forward and gobbled up a good bill-full, in the very face of the supper-party.

One of the monkeys had a private meal served all to himself; he had been doing duty all the evening outside the show, in company with the racoon. These were the decoy animals, placed as sentries on each side of the door, to attract the

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attention of visitors and cause an influx to the exchequer. This monkey was the show monkey, the best-looking of the lot, but apparently spiteful. On offering to shake hands, he showed his teeth and began a long chattering conversation, with sundry demonstrations of animosity. His master, however, assured me that "he was the biggest bounce in England, and would not harm a fly."

There was lately in "the family" just such another monkey who could not be prevailed upon to take any food when offered. It was soon observed that this creature's great characteristic was thieving; "kleptomania" (as the love of thieving is now called) was strongly implanted in his mind. So great a thief was the beast that he would not eat anything *unless he stole it*. His master therefore pretended to hide his dinner from him, and, when nobody was looking, Master Monkey would come and steal it, and enjoy it, which he would not condescend to do when placed before him in a proper monkey-like manner.

Thieving propensities, whether in man or beast, always, sooner or later, bring the owner of those propensities to grief. One day the master was painting the van with red paint, which he placed for security's sake in concealment. The kleptomaniac monkey was watching all the time, and when the coast was clear made a meal of the red paint, which gave him such a fit of indigestion that he became a dead monkey—a warning to all thieves, whether biped, quadruped, or quadrumanous.

The monkey members of "the family" require

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great care at the fall of the year, they suffer so much from cold. I saw one of them retire after supper from the bread-and-milk basin, with a ferret, which he nursed in his arms, and the two coiled themselves together as snug as could be. The master always "takes the monkeys out of the cage on cold nights, and puts them in a box together, where they warm one another, which is as good as anything." The monkeys also suffer much from bad tails; the tip becomes dead and mortified, and the result of Mr. Garbett's experience is that it is no use trying half-measures, and that an operation is the only remedy for the disease. He therefore puts the monkey, in spite of his remonstrances, into a bag, leaving the tail protruding. With a sharp knife he then separates the skin up as high as the joint of the diseased portion, and cuts it off. The bleeding he stops with a hot iron. He then brings the skin over the wound, and applies powdered resin, and a top-dressing of bitter aloes in order that the monkey shall not lick the wound. "After the operation, by adopting this plan," said the father of this "happy family," "I never have difficulties with my monkeys' tails, though I have sometimes with their manners."

Kleptomania, or the love of stealing, is a passion so firmly inherent in the monkey family, that it would seem that no monkey can enjoy anything unless it has been attained by furtive means.

I lately had a little monkey, who was such a great thief that if he had been a human being he would have been transported over and over again for numerous acts of petty larceny. I,

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however, turned his thieving propensities to good account. Master Jack (and I had him some time) showed evident symptoms of phthisis, or consumption, and I prescribed cod liver oil. It was placed openly before him, on the dining-room table, but he refused it with symptoms of disgust and sundry tail-shakings. I then poured a little into a saucer, and placed it in such a position that he should find it for himself, while I pretended to be reading and not to notice what was going on. The trap took; Jack, thinking that he was *stealing* the oil, sucked up the prescribed dose, making a face, not implying nausea, but rather high glee at his own cleverness.

This "deceit," however, was after a time discovered by the artful creature, and one day I found my friend with his long tail and arms tightly coiled round the table lamp, and stealing the colza oil as it dropped down from the wick. He managed to get one of his long spider-leg-like fingers through the brass work of the lamp, and held it till a drop of oil fell on it; he then put it in his mouth and sucked off the oil like a child sucking sugar-candy. How he could manage to gaze at the intense light, which one would have thought would have hurt his eyes when so near the lighted wick, I know not. I fancy, however, that the light bothered him somewhat, for he used to frown dreadfully while he was waiting for the oil to drop on his finger. I placed colza oil before him; no, he would not touch it; but nevertheless he had no objection to it when he stole it for himself from the lamp. He was certainly better^a and fatter for his medicine,

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which was so sweet because stolen, and I really think it saved his life.

Jack, too, had a marvellous propensity for picking things to pieces, and smashing articles that came in his way; strange to say, he never tore a useless bit of paper, or "broke" a common or valueless bit of goods. One day he sneaked out of his cage, and had a good morning's work to himself, tearing off the leather and pulling out the lining of an old armchair. He was, after an hour or two, discovered in the act, and taken into custody to be duly chastised for his mischief. He cried "murder" when he saw preparations made to punish him, but at the same time he held out his hand, firmly closed upon something in it. His pickers and stealers were unclasped, and in the palm of his hand was discovered a half-sovereign, which he had most certainly found and picked out of the chair (an old second-hand one), and which probably had been buried in its lining for years. His proffered ransom got him off his punishment, but his investigations into the structure of watches, books, ink and cruet stands, writing-desks, MS. notes, etc., did not afterwards produce equally valuable discoveries.

Nothing pleased Jack so much as to make his escape, Jack Sheppard fashion, from the wire cage in which he was kept by the kitchen fire. He would pick and pick, with his long skeleton-like fingers, till he found the staple loose. If anybody happened to look round at him while he was at work, he would drop instantly on the hay and pretend to be asleep. When he managed to get

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the door unfastened, he would not bolt out in a moment, but push it open as gently and gradually as a burglar. He would then sneak out, and the cunning rascal would carry his chain in a curl of his tail to prevent it rattling on the stones and the servants detecting his pranks. His object was to get to my room, and on looking up I frequently found my friend nestled inside the fender. He came into the room so quietly that I did not know he had escaped from his cage till he called my attention by a friendly chatter, as much as to say—"I've got loose so cleverly, you really must not scold me for it."

When winter came on I always had a coat made for him, which was sewed on at the back like a baby's stays, or he would not rest till he had unpicked the stitches and got it off. As it was sewed at the back he could not get at the stitches. Jack's tailor was the regimental tailor of the Second Life Guards. When the tailor made him his first coat he made him the coat of a "Troop Corporal-Major," putting the crown and four stripes on the right arm. Jack soon set to work and pulled off the crown, and then one by one the stripes. The coat was sent back to the tailor for repairs, and when it was returned we found that Jack had lost rank, for he had now only three stripes on his arm and was therefore a "Full Corporal." These he destroyed, and he was then reduced to two stripes, and made only a "Lance-Corporal." The punishment however did not take much effect on Jack, for he at once deliberately set to work to "destroy his kit, contrary to the Mutiny Act." All hopes

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of his reformation were then given over, and Jack was reduced with disgrace to "Full Private," with no stripes at all, and he remained Full Private the rest of his days.

Jack was a little South American Capuchin, so called because the markings on the head are not unlike a monk's cowl. I bought him of Jamrach, who called him a "Musk Monkey." Even though he did not smell of musk, there was seldom any unpleasant odour about him. Should any of my friends wish to have a pet monkey, let me advise them to get a South American monkey of the same particular genus (*Cebus*), and never an Old World monkey; these American monkeys are thrice as intelligent as their non-prehensile-tailed relatives; but I know not the reason of this.

The activity of my monkey was something extraordinary. He knew well enough when the orders were given to take him to bed, and move him from his comfortable corner under the fender, for he was a lazy rascal and did not like going to bed early or getting up before eleven o'clock in the morning. When bedtime arrived, if not immediately secured before he was aware of his coming fate, he would cry like a naughty child; he was off like a bird, and catch him if you could; no art, no inducements, no devices, ever so cunningly used, would induce him to come within arm's length, and it was sometimes half an hour's work to get him at all.

If it be so difficult to catch a monkey in a room, how much more difficult (I thought, to myself) must it be to catch the wild monkeys out of the

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lofty trees in their native forests, for exportation. I therefore put the following query in the *Field* :—

“I should feel most obliged if any of the correspondents who live in monkey countries would kindly tell us how the monkeys that are brought to England, France, Germany, etc., are caught. Are they taken when quite babies, or are traps set for them; and, if so, of what kind? It has always been a puzzle to me to know how the natives can possibly get hold of them, except as quite little things; and even they must have been difficult of capture in the open forest, and troublesome to rear afterwards. I should much like to see a trap that would catch a monkey alive and uninjured. Monkeys are the most knowing and suspicious of the whole animal creation; and I doubt even whether ‘High Elms,’¹ with all his science and knowledge of trapping, would catch a monkey without injuring him and spoiling his sale.”

The following answers were kindly sent to me, first, by Mr. John Mauley, who writes :—

“In answer to the inquiry by Mr. Buckland, I may say that the country people in the province of Pernambuco, Brazil, catch both monkeys and parrots by exposing for their use a spirituous preparation of cahaça (cane rum) and the fruit of the cajá, a species of spondias or hog-plum, for which the animals have a partiality; this partiality I have verified with animals in captivity.—JOHN MAULEY.”

Secondly, by Mr. J. W. Slade, who says :—

“I can corroborate your correspondent John

¹ Author of a most excellent book on the art of trapping.

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Mauley's answer to Mr. Buckland, by the following extract from Parkyn's *Life in Abyssinia*:—"These monkeys are caught in various ways. One plan adopted by the Arabs of Tàka has struck me as most simple, and at the same time as likely to succeed as any other; jars of the common country beer, sweetened with dates and drugged with the juice of the *oscher* (*Asclepias arborea*), are left near the places where they come to drink. The monkeys, pleased with the sweetness of the beverage, drink largely of it, and, soon falling asleep, are taken up senseless by the Arabs, who have been watching at a distance."—J. W. SLADE."

Another way of catching live monkeys I read in the *Technologist*, Feb. 1862, No. XIX:—"The Sapucaya nuts are found in Brazil, and are also called by the name of 'Pot-plants,' or 'Monkey nuts.' They open by a sort of lid, which falls off, leaving a large opening sufficient for the nuts to fall out. So eager are the monkeys to obtain the nuts, that they will thrust their hand into this opening, which they do with difficulty, and grasp the nuts; but the orifice which admitted the empty hand will not allow the egress of a full one, and the animal will torment itself a long time rather than relinquish its hold. The Indians avail themselves of this cupidity to entrap the monkeys. They open the lids of several capsules, and then throw them under the trees; the greedy monkey will not be satisfied with one pot, but will thrust its hands into two, and will not relinquish its hold; the encumbrance renders its capture easy, and has led to a saying amongst the Brazilians, equivalent

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to our 'Old birds are not caught with chaff;' it is, 'He is too old a monkey to be caught by a cabomba,'—the capsule being called by them a cabomba."

In that admirable work, *The Naturalist on the Amazons*, by my friend Mr. Bates, I was pleased to read another way of catching monkeys in the forest. Mr. Bates writes: "The white uakari (*Brachyurus calvus*) are obtained by shooting them with the blow-pipe and arrows tipped with diluted ürari poison. They run a considerable distance after being pierced, and it requires an experienced hunter to track them. He is considered the most expert who can keep pace with a wounded one, and catch it in his arms when it falls exhausted. A pinch of salt, the stated antidote to the poison, is then put in its mouth, and the creature recovers."

I once bought a wretched, forlorn-looking African creature for the sum of 4s. This was real charity to the poor beast, for his "dog-dealing" master, disgusted with him "because he cost him 6d. a day to grub him," had just concluded arrangements for a "monkey hunt," which of course did not come off, as the monkey was not forthcoming.

On bringing him home, I found that about an inch of his tail was as hard and dry as the end of a fagot stick. I therefore took out my penknife, and, as I had been taught to do by the owner of the "Happy Family," gradually pared it away. I expected every moment Master Monkey would have resisted and shown fight; but no, as long as I gave him no pain he made no resistance whatever, but sat down on the table as quietly as possible,

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while he looked on as though I was operating on the tail of some other monkey, and laughed and grunted at the fun. At last I pared his tail down close to the living skin and bone, and hurt him a bit. Reader, if you have had a corn cut, and been hurt in the operation, you can appreciate the tremendous expostulations and grimaces, on the part of the monkey, which he poured forth with all his might the moment I came down to the "quick of his tail." The operation was, however, quite successful, and the monkey, after his tail was diminished in size, immediately began to improve in health and in personal appearance. It is a curious fact that monkeys with prehensile tails never gnaw or bite them; they seem to know too well that this "third hand" is too valuable to be used for food, even by themselves.

The owner of the "Happy Family" told me that the greatest difficulty experienced in making "his family continue in a state of happiness," is to supply a vacancy caused by death or accident among its members; for, like boys at school, the aborigines surround and tease the fresh comer. When it is found desirable to fill up a vacancy in this miscellaneous collection of birds and beasts, the new arrival is placed in a portion of the cage divided and separated from the rest, where free liberty of speech is allowed, but yet "paws off" is the order of the day; in this manner reconciliations soon take place. There is one animal, however, which, above all others, is difficult to tame—it is the hedgehog. There is more trouble required with this creature than with any other,

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for he is of a morose disposition, and timid withal; and it is a long time before he will fraternize with his fellow prisoners, for he coils himself up in a lump, sets his bristles in formidable array, and "the more you stir him up the more he won't uncoil." Hares, too, are difficult to tame; and it is a curious fact, that I have learned from several quarters, besides from the poet Cowper, that hares differ much in mental ability, some being very stupid, others very clever. In judging of the performing abilities of a young hare that is about to commence a course of instruction on the drum or tambourine, notice should be taken of the diameter of the forehead, for experience has laid it down as a law that, with hares as with men, the more brains they have in their skulls the better learners they become. This is particularly the case with horses : reader, please observe for yourself.

It has often been a subject of regret to my mind, when reading the accounts of sportsmen and naturalists of their doings in the pursuit of wild animals (whether in the desert or in the forest), that more attention is not paid to the observation of the habits of the animals, and that their "social customs" are not more attended to; for, depend upon it, all animals, whether wild or tame, have their customs and habits as much as we have, and of these we know little or nothing. Most animals quickly ascertain the presence of man; in an instant they are on their guard, waiting for their enemy. What can the sportsman then tell of their habits? Let him at this moment (unless pressed by hunger) put down his rifle and take up his

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telescope, and he will most assuredly learn something he did not know before, and will probably ascertain some fact in natural history hitherto unknown to science.

In reading the accounts of the pursuit of the mighty elephant in the 'jungle' of India, of the watching for the beasts of the forest drinking at midnight at the lone desert fountain in Central Africa, of the fierce gorilla in the dense forests of the tropics, or of wild ducks and swans on some lonely lake or swamp, I often come on the most exciting description of the discovery of these creatures, feeding quietly and undisturbed in their native homes. What a chance, what an opportunity of learning their habits, and their loves, and their wars! But—No; man thirsts for their blood. A few lines further down in the page of the book we read the old story—I mentally hear the ring of the rifle or gun—and in an instant a beautiful scene of Nature is ruthlessly dissipated. The frightened creatures fly hither and thither; what was but just now all happiness and quiet, resolves itself into bloodshed, turmoil, and misery.

There are thousands of "Happy Families" of Nature's own making, enjoying life and health in solitary and sequestered spots all over the face of the earth. I grant that man has a right and just power given him to destroy, either for food or raiment, all creatures below him in creation, but he should not wantonly abuse this power—let him temper it with mercy. The possession of the hunted beast or bird is never equivalent to the pleasure of its pursuit. Life is easily taken away,

A Happy Family

but can never be restored. Every living thing, after its kind, enjoys life and happiness : let it be the privilege of those who have the much-to-be-envied opportunities of observing Nature's handiwork in the forest, the desert, or the field, to open their eyes and drink in knowledge at a small price.

Let a knowledge of the habits of an animal or bird be of far greater value to the sportsman-naturalist than the possession of its bleeding carcase, from which all that we can learn of its habits must be by examination of its structure. Many a volume might be written upon the habits of animals, but it never can or will be written unless the advantage of observing living creatures be impressed upon sportsmen, who will have to carry home a lighter bag, but yet more than its equivalent in the knowledge of new and valuable facts.

Nature has ordained that *all* her families should be happy. A poor man in Windsor fair demonstrated to us, practically, the pleasure of looking at and observing animals and birds undisturbed, and without the fear of men among them. Let those who have the opportunities learn from him, and let them stay the *wanton* hand of destruction.

If travellers and sportsmen will only do this, they will add to their own—and at the same time not deprive other creatures of that most valuable of all possessions—HAPPINESS.

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PETHERICK'S HIPPOPOTAMUS

WHEN my friend, Mr. Petherick, the well-known explorer in Central Africa, arrived in London, some three or four years ago; from Khartoum, Sudan, Upper Egypt, he brought with him a young hippopotamus. In one of his expeditions he came (he told me) to a lake full of vast beds of reeds, between which there flowed little streams of water. When sailing slowly along, the man at the masthead (who was looking out for open passages among the vegetation) descried a small dark-coloured mass upon a bed of reeds. This object they made out to be a baby-hippopotamus, left by itself by its mother, who doubtless, when she quitted her home, thought her young one was safe enough. The men jumped into the water, and catching the little rascal in their arms, brought him into the boat. During this operation he cried and squealed lustily, after the manner of our familiar porcine friends at home. He was a baby, and not a fine baby at all for a hippopotamus, for he was not much larger than a terrier dog, and probably not more than about two days old. The mother-hippopotamus luckily did not hear the screams of her infant, or there would have been a fight between biped and quadruped for the possession of the "squeaker."

Young Hippo was consigned to the care of one of Mr. Petherick's Arab hunters, Salama by name, who brought it up with the greatest care, and, I may say, affection. Mr. Petherick brought down

Petherick's Hippopotamus

the Nile with him no less than four live hippopotami : this one I am writing about alone survived out of the number. Two of these animals were lost in consequence of the boat in which they were striking on a rock in the cataracts and sinking. One of the animals was hampered in the boat, and was drowned; the other swam to shore, and of course escaped; the third died a natural death.

When the first hippopotamus, in the year 1850, was sent over from Egypt, he was provided with all sorts of creature comforts; an army of cows and goats accompanied him, to afford him milk; he had a huge portable bath to bathe in, and, in fact, travelled *en prince*.

His less fortunate relation arrived in much more humble style. When the dray arrived at the Zoological Gardens from the railway station, we were all of course very anxious to see the new arrival. The tarpaulin being taken off, there was discovered a huge box, made of strong deal boards, like a diminutive railway horse-box, and in this Hippo had travelled all the way (with an occasional bucket of water thrown over him) from Alexandria, thereby proving an important fact, that he can dispense with the bath without other prejudice than a rough skin. How to get him into his sleeping-apartment was the question. Salama assured his master that Hippo would follow him anywhere. One side of the box, therefore, was taken off, and out the poor frightened beast walked. Salama gave him his hand to smell, and he trotted after his kind protector with a long, steady, calf-like trot, swinging from side to side,

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while he kept his head close to his master, staring about him like a frightened deer.

He was about the size of a very large bacon hog, only higher on the legs. From not having been able to have a bath for six weeks or more, his skin had assumed a curious^e appearance; the back, instead of being soft, slimy, and india-rubber-like, was quite hard and dry, and the skin was peeling off from it as from the bark of a tree; it was, in fact, much more like a bit of an old forest oak than of a water-loving animal. It was of course expected that the moment Hippo smelt and saw the water he would rush into it; but no—he merely went up to it and smelt it with a look of curiosity, as though he had never seen water before; and it was not till the Arab himself advanced partially into the water that Hippo would follow. He soon came out again, and was only persuaded to go right into the deep part of the water by the Arab walking round the edge of the tank. Hippo then began to find out where he was, and how comfortable the warm clean water was. Down he went to the bottom like a bit of lead; then up he came with a tremendous rush and a vehement snorting; then a duck under, then up again, prancing and splashing in the water after the manner of Neptune's sea-horses that are harnessed to his chariot in the old pictures of the worthy marine deity. I never recollect to have seen any creature, either man or beast, so supremely happy for a short time as was poor travel-worn Hippo in his bath after his long voyage of so many thousand miles.

Petherick's Hippopotamus

Coming out of the water, Hippo smelt about for food; mangold-wurzel was given him, and mightily did he enjoy it.

Like all young animals in a strange place, he kept a close eye upon his keeper, and gave a peculiar half-bellow, half-cry, when he went out of his sight, refusing food until his return. Evening soon arrived. Hippo retired to rest by the side of his faithful nurse, who reported the next morning, that whereas, on ordinary occasions, if he coughed or moved, or made the least noise in the night, Jamooss (the Arabic for hippopotamus) would wake up and answer, the night of his arrival he slept a sound sleep, waking only at sunrise for his breakfast and his bath, which he again mightily enjoyed. His skin soon began to lose its bark-like appearance, and to get soft, slimy and of a black, pinkish colour.

Though tame enough to his keeper, Bucheet (for that was the familiar name his keeper gave him) had a temper of his own, which he would occasionally show to strangers.

As regards the danger from the hippopotami when at home, Mr. Petherick told me that they are not to be feared when the traveller is in a large boat, but that they will follow with intent malicious the smaller rowing boat. They will make their attack in two ways, either by rushing in a succession of springs or bounds, every one of which brings one-half of the body out of the water, and, when alongside, rise open-mouthed and endeavour to carry off some one on board; or by driving full speed under, and using their immense

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head as a battering-ram, strike the boat with such force as to make her quiver from stem to stern. Mr. Petherick has known planks knocked clean out of the side of a boat, sinking her almost instantaneously and before the shore could be reached by her astonished crew.

On one occasion Petherick lost a man out of the boat, the hippopotamus rising out of the water, and seizing him in his fearful mouth. The body was cut in two by the animal's teeth. The hippopotamus cannot bear to be cut off from the water. One of my friends was once tracking a beast that had gone inland. The brute heard him and, turning round sharply, charged him; then, catching him before he could get out of the way, tossed him high up in the air, without, however, doing him more bodily harm than frightening him out of his wits. Nothing could afterwards induce this hunter ever to follow hippopotami on shore. These huge beasts make a fearful bellowing and crying noise at night, often to the traveller's great discomfort.

My late friend, Dr. Genzick, of Vienna, told me that he once shot a hippopotamus. He got a fair and steady aim at him, the beast probably imagining the man in the boat did not see him, as he had sunk himself deeply into the water, leaving his nose and eyes only exposed. The ball struck the hippopotamus full on the head, and he sank instantly to the bottom, where he kicked up such a turmoil that, as Genzick said, "one would have thought there was a steam-engine gone mad at the bottom of the river." However, the Doctor

Petherick's Hippopotamus

never found the hippopotamus, though he hunted everywhere for him, but the next year he discovered his whitened bones upon a sand-bank some distance from the place where he had shot him. He knew it was the beast he had shot the year before, for he recognized the bullet he found in his skull as his own make.

During a visit to Paris, some six years back, I heard that a young hippopotamus had just been born at the *Jardin des Plantes*. I went up to see it, but it was dead. It appears that the poor little thing was born in the water, and paddled round and round the sides trying to get out; the mother endeavoured to help it up with her head, but she somehow managed to injure or else drown it.

Every one is well acquainted with our old friend, the hippopotamus at the Zoological; but every one may not know that he once had a tooth drawn, and that by a non-professional dentist, and with a pair of forceps made expressly for the purpose. Mr. Bartlett was the operator, and I think, after the reader has read his communication, he will agree with me that he deserves great credit for his ingenuity and the surgical skill he displayed with his huge patient. Mr. Bartlett writes to me as follows :—

“ MY DEAR MR. BUCKLAND,

“ You will be glad to know that I have succeeded in performing perhaps the largest, if not the greatest, dental operation on record.

“ Our male hippopotamus has been, as you know, suffering from a fractured tooth, and fearing

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that the consequences might be serious, I had a strong oak fence fixed between his pond and the iron railings, and I then determined to remove the broken tooth; this I accomplished on the morning of Wednesday last, but not without a fearful struggle.

“I had prepared a powerful pair of forceps, more than two feet long; with these I grasped his fractured incisor, thinking, with a firm and determined twist, to gain possession of that fine piece of ivory. This, however, was not quite so easily done, for the brute, amazed at my impudence, rushed back, tearing the instrument from my hands, and, looking as wild as a hippopotamus can look, charged at me just as I had recovered my forceps.

“I made another attempt, and this time held on long enough to cause the loose tooth to shift its position, but was again obliged to relinquish my hold. I had, however, no occasion to say, ‘Open your mouth,’ for this he did to the fullest extent; therefore I had no difficulty in again seizing the coveted morsel, and this time drew it forth, with a good sharp pull and a twist, out from his monstrous jaws. One of the most remarkable things appeared to me to be the enormous force of the air when blown from the dilated nostrils of this great beast while enraged. It came against me with a force that quite surprised me.

“A. D. BARTLETT.”

Lions at the Zoological Gardens

LIONS AT THE ZOOLOGICAL GARDENS

It is strange how that, amidst the high state of civilization to which we, the present inhabitants of the earth, flatter ourselves we have attained, there still lurk here and there relics of the customs of the ancient men, the first pioneers of civilization. One of the most marked customs of our rude, warlike, but yet highly respected forefathers, was the choosing of emblems, whereby not only individuals (witness the helmets and banners of the Knights Templars), but even whole nations, might be distinguished and characterized one from the other. In sacred as well as profane times, we find that animals have been chosen as fit tokens and signs to be emblazoned on the standards of armies when they went forth to war. Thus, when the Tribes of Israel were first separately designated, the Lion was chosen as the standard of Judah.

We have but to look around us even at the present time to find the same idea still prevalent. The Russian double-headed eagle extends its power over vast tracts of the old-world continent; the Austrian eagle has frequent times and often met face to face in deadly combat with the Gallic cock; the eagle of the warlike Romans spread its conquering wings over the downcast walls of the sacred city; but what animal out of the whole creation has England, the favoured country to which we belong, chosen as its representative? Need I mention that the king of beasts, the lord of the forest—the LION—stands forth in all his

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natural beauty and graceful magnificence as the type of the Englishman and of the English nation ?

We have heard of late much of the lion's habits when at home, and travellers do not give him so good a character for courage or for such noble attributes as he is supposed to possess. No man, however, is a hero in his nightcap; and it is not altogether fair to tell stories out of school.

Anyhow, I would venture to observe that, whatever the Lion may be said in books to want in daring and bravery, he evidently possesses some great and formidable qualities; for were it not so, how is it that travellers are always in such a desperate hurry to get out of his way, and keep such a respectful distance from his majesty's person when he is offended ? Then, again, what in nature can be grander than the voice of this "Desert King" ? How do hearts, both of man and beast, quail, when, camped in the solitude of the wilderness, far away from human aid, the terrific roar of the lion falls upon their affrighted ears amidst the howling of the wind, the crash of the storm, and the peals of heaven's artillery ! The Lion is awake, he is hungry ; we know not how near he is ; we know not who is to be his victim !

The sun is just sinking down at the edge of the wilderness, and a long dark stormy night is at hand ; the clouds are rolling up heavy and dark from the horizon. The elands and the antelopes are on the distant plain cropping their evening meal in peace, and lo, from behind the rocks stalks forth a huge dark cat-like figure ; silently and lightly as a shadow he moves his giant and



THE HAUNT OF THE DESERT KI

Lions at the Zoological Gardens

ponderous frame—his foot-fall is unheard even by his victims, proverbially swift of ear.

At his side are the jackals; the one gazing eagerly at the beasts which he is well aware his friend the lion will soon lay bleeding at his feet; the other, thin and famishing, is cracking up a bone long since dried up by the heat of the sun. They will both soon have an ample supply; only wait awhile, till their master has slain his victim.

The sun disappears—then the Lion's thunder-roar peals along the plain—night comes on.

“Darkness He makes the earth to shroud,
While forest beasts securely stray,
The lions roar their wants aloud
To Providence, who sends them prey.

Who can listen to the chanting of the 104th Psalm—that grandest of grand poems on nature's works and power—in Westminster Abbey or St. Paul's Cathedral, without feeling a thrill run through him when the deep bass notes of the organ and the swell of human voices proclaim that

“THE LIONS, ROARING AFTER THEIR PREY, DO SEEK
THEIR MEAT FROM GOD” ?

Who, again, can doubt the beauty of the many passages in Holy Writ where this noble beast is mentioned, or can gaze upon the sculptures of nations long passed away, without feeling that the Lion is indeed a noble beast—next to man himself, perhaps, the most glorious specimen of the handiwork of the Creator ?

Shall we not, therefore, feel proud that the Lion is by all and everybody considered as equiva-

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lent to the Englishman and the English nation ! The Lion has gigantic strength, individually and collectively—so has the Englishman. The Lion is playful and kind in disposition when properly and respectfully treated—so is the Englishman. The Lion loves fair play⁴; he gives notice of his displeasure with a word, and follows it by a blow—so does the Englishman.

The Lion has a good appetite, and his principal and best-loved food is beef. Who can say that the Englishman does not resemble him in this point ?

Let us, therefore, for once go and see the Lions at dinner at the Zoological Gardens, even though they are prisoners, poor beasts.

But we must first go into the kitchen to see the dinner prepared for the Lions. Our old friend William Cocksedge—who has had over thirty years' long and faithful service with the lions, and who really loves his beasts; and, if action mean anything, is beloved by his beasts in turn—shows us the good things he has provided for his pets. The daily rations of the lions are alternately beef and horse; and each beast is allowed from eight to twelve pounds of meat, weighed with the bone. The "lordly dish" in which the dinner is brought is a wheelbarrow kept sweet and clean; the knives and forks are provided by the lions themselves in the shape of sharp teeth and claws; and the dinner is "served" on an instrument well suited to the purpose. Cocksedge also, from time to time, provides condiments with the meat; for upon it he occasionally sprinkles a proper allow-

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ance of common flower of brimstone, or sulphur, as this keeps the animals in good health and condition, upon the principle of occasionally giving our own youngsters a treat of brimstone-and-treacle by way of a change.

It has been aptly remarked that the nearest way to the heart is down the mouth, and this maxim holds good as well with beast as with man; besides this, it is wonderful how the human and the brute memory, though oblivious of other matters, *never* forgets the dinner hour. There is a story of a cavalry officer, who, when examined by the commanding officer as to the meaning of the various trumpet calls, confessed, after many bad shots as to their signification, that he really only knew but two, and they were—"dismiss" and "dinner." So, too, the lions know well their dinner call, which is simply the rumbling of the wheelbarrow over the stone pavement in front of their dens. It is most curious to witness how well the poor brutes know this welcome sound. The big leopard sits up on his haunches, and makes a sort of half-yawn, half-laugh, showing his pink lips, his rough tongue, and his ivory teeth, as much as to say, "Well, *I* am ready at all events."

The tigers, Bill and Bess, jump one over the other at a game of leap-frog, as though they were perfectly indifferent as to what was going on. As we ourselves, when waiting for dinner, have but one thought (and that is, "How soon will dinner be ready?" but do not care to show that this thought is uppermost in our minds), so do the hungry carnivora attempt to while away their

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time in feline conversations about the weather, and looking over sawdust albums.

Then, again, look at the old Lion—a hearty old fellow, strong, powerful, in good health; his noble eye gleaming with pleasure; his mane—long, glossy, thick—is all bristled up; his tail lashes quickly and eagerly from side to side. Of course he is not hungry; oh dear no! but yet why does he pace up and down in front of the bars of his cage like a sentry on a cold frosty night? And why does he perpetually sweep his magnificent mane against the bars, reminding us of the marble lion in the statue of Andromeda and the lion? And why does he attempt impossibilities, by doing his best to peer round the corner to look for his dear friends Cocksedge and the wheelbarrow? They at last appear in company, and then look at the games all the hungry creatures begin. The lions Jane and Jack dance the sailor's hornpipe, accompanying themselves with their own elegant music. The jaguar skuttles round and round his den, and the hyæna plays the bagpipe for the lot. Then comes Cocksedge; he gives a bit of meat to the jaguar.

“Here you are, you saucy old hussy; give us your paw for it; well, you want a bigger bit, do you?” Pussy purrs assent. “Here’s a good pennyworth; then you can eat the rest by-and-by for your supper. Don’t be greedy now, my pet.”

What a treat it is to see how these wondrous carnivora clutch their meat through the lower bar of the den! How proudly they retire with it to the rear of the den, and how some of them seem

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really to enjoy it! Let us wish them "*bon appétit*."

Alas! alas! but a short time after I saw the old lion so thoroughly enjoying his dinner, Mr. Bartlett kindly sent me word that the old patriarch had died very suddenly, and at the same time he invited me to be present at the dissection.

It appeared that the lion was quite well on Saturday night, and ate his food heartily as usual; but when the keeper came on Sunday morning, behold, the poor beast was extended full length, dead and stiff upon the straw of his bed, having apparently died without a struggle. Alas! poor Lion!

Our defunct friend had been in the Gardens about twelve years, and when he arrived was a cub so small as to be easily lifted by a man into his den. He was a famous roarer, and those who lived near the Gardens must frequently have heard his thunder-like voice at sunrise and sundown. His height at the shoulder was about 4 feet; length of the body, 5 feet 8 inches; of the tail, 3 feet 5 inches; altogether a very large and powerful animal.

There is very much to be admired in this gigantic representative of the cat tribe; in it we find monstrous strength combined with great activity and elegance of form, amounting to positive beauty. Again, we see how admirably each organ is suited to co-operate with its neighbour; how the padded feet correspond with the nocturnal eye, how the scissor-like teeth are adapted to

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work with the pointed claws, and how the whole muscular system, closely locked and knitted to the bones, wields with ease the formidable destructive weapons with which it has been endowed.

The first thing that struck me, on looking at the dead animal, was the massive and herculean fore-arm—a compound of the hardest muscles and wire-like tendons : a measure told us that the circumference of this powerful limb was no less than 1 foot 7 inches, or nearly the size of an ordinary hat. Then the gigantic foot arrested the attention, for it measured, at the lower surface, $6\frac{1}{2}$ inches, and when outspread, 8 inches.

A delicate, soft, harmless-looking foot is this, with a beautiful fringe of fur round the edge ; but what do we see under this fur ? Snugly concealed, like riflemen in ambush, are those dread claws, which, when extended, and intent on blood, will tear furrows an inch or more deep in the thick skin of a buffalo or giraffe, or hold the powerful eland with a vice-like and deadly grasp. Then, again, remark the soft, velvet-like pads which fill up the hollow of the foot (the largest pad being 4 inches broad). Has human ingenuity ever contrived, or will it ever contrive, any such elastic, firm, yet noiseless material, which shall enable the wearer to steal up with a ghost-like motion upon the unsuspecting prey, be he ever so wide awake ? We strip the skin from the foot, exposing the tendons (or leaders), which, though beautifully white and rounded, possess the strength of the twisted iron-wire rigging of a ship, and work with the ease of a greased rope in a well-worn pulley. We admire

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their excessive complexity, yet their admirable arrangement; and tracing them up to the actual claws, or talons, perceive how marvellous, yet simple, is the arrangement by which these formidable and lethal weapons are, without effort on the owner's part, made to retract into a secure place of protection, and their sharp points to be sheathed like a dagger in its scabbard. Doubtless the inventor of the india-rubber spring, which spontaneously closes the door of our dwelling-room, thought he had made a great discovery; but he is probably not aware that in the lion's foot he may find the pattern of his invention registered by nature herself.

Protruding from the lion's lip, on either side, we observe a formidable display of whiskers, which in our own species are generally more for ornament than for use. In our friend the lion, on the contrary, we find that nature makes them serve a beneficial purpose, for they act as feelers, and those, too, endowed with great sensibility. When it is too dark to see, the lion feels his way through the underwood by means of his whiskers, and pounces upon his prey. How is this done? We trace one of the whiskers to its root, and find that it terminates in a mass of highly-sensitive nervous substance, which forms an oblong bulb, as large as an apple pip; each hair has its own bulb, and these whiskers are therefore so many watchful sentries which take their posts on dark stormy nights, when the regular duty-men (the eyes) are unable to keep watch and guard. The same arrangement holds in our domestic puss. Should

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you doubt this, pull puss's whiskers sharply and mark the result.

The Lion is gradually crawling up to seize his unsuspecting prey, and his eyes are fully occupied in watching their movements. He has, therefore, not much attention to spare for other things. He is, however, enabled to glide through the under-wood and among the rocks by means of his outspread whiskers, which, just touching the obstructions, telegraph silently to his brain, "keep to the right, keep to the left, ground free," etc.

The seal too has these whiskers with their sensitive nervous bulbs. In this case the idea is the same, viz., to enable the seal to give his whole attention to the fish he is pursuing, while the whiskers prevent him from running foul of the rocks among which the hunt is going on.

The ox and the giraffe have long flexible *prehensile* tongues, by means of which the animal is enabled either to cut the short grass of the field, or pull off the leaves from the lofty palm-trees. Not so the lion—the dread slayer of the herbivorous races—his tongue is by no means smooth or prehensile, but, on the contrary, broad, thick, and rasping. The papillæ, or elevated spots, which in most animals are soft and velvet-like, in the lion are converted into prominent and sharp horny excrescences. In the fresh state the tongue feels rough to the hand, but as it is dried the roughness becomes more perceptible, till at last we have a surface more like that of a farrier's new file than of a tongue. In the dry tongue of the lion now before me, the horny spines at the top of the tongue

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are no less than one-sixteenth of an inch in length; they gradually get smaller towards the root of the tongue, where they are set in oblique rows like the teeth on a file. Now this rough tongue is of great use to the beast, for having struck down his prey with his sledge-hammer claws, and gnawed by mouthfuls the flesh from the bones, he finishes his dinner by scraping at the bone with his tongue, and literally rasping every remaining portion of meat from off it in a more perfect way than does even the butcher from the marrow-bones he sends out to his customers. Domestic puss has this rough tongue as well as the lion. It may be well seen when she is lapping her matutinal milk, or picking at the rejected chicken-bone.

I must not forget, talking of horny spines, to mention the much-disputed story of the "claw at the tip of the Lion's tail." The first thing I did was, of course, when at the lion's post mortem, to examine if any such claw, or anything approaching to a claw, existed concealed on the tail of our specimen; but my search, as I expected, was not successful.

MY ADVENTURES AND JOURNEYS WITH PORPOISES

ON Thursday morning, November 27, 1862, Mr. Bartlett sent a messenger to the 2nd Life Guards' Barracks, Regent's Park, to say that he had just received a live porpoise.

I immediately went over to the Zoological

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Gardens, and found the poor beast placed in a tank of sea-water behind the aquarium-house.

I at once perceived that the porpoise was "very bad." He was upon his side—every now and then turning up his white-waistcoat-like under side. His breathing, or rather blowing, was hard and laboured, and his wonderfully-constructed "blow-hole" at the top of his head was working with difficulty. I counted his respirations, which were eight in the minute, loud and powerful (especially the expirations), reminding one of a man snoring heavily.

It was quite evident that this porpoise was in a very exhausted state, and I could not help reasoning thus:—Here we have an animal with a four-cavities heart, warm-blooded, and provided with air-breathing lungs; his system is exhausted, and he feels faint.

Reasoning thus, I could not but advise stimulants, as with a human being; and, having gained the permission of Mr. Bartlett, we agreed to give the porpoise a dose of ammonia, but how to do it was the question. There was only one way; so I braved the cold water and jumped into the tank with the porpoise. I then held him up in my arms (he was very heavy), and, when I had got him in a favourable position, I poured a good dose of sal-volatile and water down his throat with a bottle.

This treatment I really think had some salutary effect, for his respirations, which when I first saw him were eight in the minute, increased to ten, and then to twelve.

In two hours' time I paid him a second visit, and again going into the water, lifted the poor

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beast up as well as I could, while Mr. Bartlett poured down his throat a good glass of stiff brandy and water. Again the results were good; the respirations increased to thirteen a minute.

Perceiving that the water in which he was floating was stained with blood, I examined him all over, and found a wound in his tail which had begun to bleed. This I soon stopped with common salt. The bones of his left fin were also fractured.

Seeing that the porpoise did not get much better, Mr. Bartlett and myself agreed to give him another chance; so we fished him out of his tank, and carried him quickly to the seal's pond, and put him carefully and gently into the water. In about an hour he got decidedly better, and of his own accord swam twice across the pond, using his tail with the peculiar motion found only in the whale tribe. He was, however, very blind and stupid; for he invariably hit his nose against the edge of the pond.

There were only two objectors to the porpoise being placed in the seal-pond, and these were "Kate" and "Tom," the two seals, the rightful inhabitants thereof. It was most absurd to see them bolt away, under water, in the greatest alarm, to the further end of the pond, turn suddenly round, and stare up at the poor sick porpoise with their huge eyes and their nostrils distended to twice their size; and then down again they went in an instant, plunging under their house, shortly to reappear and have another long and frightened stare at the intruder.

As I feared, this poor porpoise, who had been caught at Brighton, and allowed, unfortunately,

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to spend several hours panting on a fishmonger's slab in Bond Street, died, after all, in spite of our efforts to save him. Two days after his arrival at the gardens the poor brute was found dead on the top of the seal-pond, and the seals sang pæans.

Mr. Bartlett and myself conceived the greatest hopes that, by perseverance, we should one day be enabled to get a live "sea-pig" to the Gardens. I consequently wrote to friends at the sea-side, and at the same time put notices in the "public journals" to request those who had the opportunity would secure a live porpoise, and Mr. Bartlett or myself would come and fetch it up to London.

In answer to one of my letters I received a communication from Mr. Briscoe, of Southsea, who told me that he had placed up on the sea-shore, near Portsmouth, the following :—

NOTICE TO SICK PORPOISES.

If Visiting this Beach,
their carriage to London will be paid.
A DOCTOR will be in attendance, and MEDICINE,
in the shape of
No end of Grog, will be found.
Please land early.

Apply to

FRANK T. BUCKLAND,

Regent's Park Barracks.

2nd Life Guards.

Unfortunately, no porpoise availed himself of the above advantages.

We had to wait for a porpoise till March the following year, when, on the 14th, I received a telegram from Mr. Dutton, of Eastbourne (who had kindly been looking out for me for some time), that a live porpoise was waiting my arrival on the Brighton beach.

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I went down to fetch him for the Zoological Gardens, but :—

When I got there,
The beach was bare,
And, lo ! the poor porpoise was dead.

It appears that the fishermen had seen the reward of £2 offered for a live specimen, and had caught one on Thursday morning in a seine-net, with considerable difficulty. They placed him in a boat which they filled with sea-water. He was alive on Thursday night at 12 P.M., but was dead on Friday morning. The men thought some mischievous person had killed him by placing the finger in the blow-hole. So I returned to London sad and porpoiseless.

The third porpoise arrived at the Gardens in October following. On hearing of his arrival I forthwith hastened to pay my respects. I found our new specimen (about 4 feet long and 33 inches round the chest) in the pond with the sturgeon. The sturgeon seemed terribly jealous of the porpoise being put into *his* pond, and swam about the bottom, and round and round, looking as savage as a fish *can* look. He kept at a safe distance from the intruder into his rightful domain; and when the porpoise was at one side of the pond, you might be quite certain that the sturgeon was at exactly the opposite point in the circle. I suspect the poor sturgeon was troubled not only by his visitor flopping round and round like a horse in a mill, and disturbing the water all day with his rudder-like tail, but that he was kept awake at night by the snoring of the porpoise; for if his marine visitor

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made such a noise breathing in the ordinary way during the daytime, what must have been the frightful consequence of his stertorous breathing at night ?

This porpoise was much fatigued by his journey. He left Boston, in Lincolnshire, at 7 A.M. in a railway train, and he had, on arrival, been nearly eight hours out of water.

Mr. James Martin, of Wigtoft, near Boston, sent him down, carefully wrapped up in a wet blanket and surrounded with wet grass. Plenty of water was also sent, and this was from time to time poured on his back, to keep his skin and blow-holes moist.

When placed in the pond, he sailed round and round the *margin*, with his head half out of water. Mr. Bartlett thought he did this because he was in a strange place, just as a wild bird or beast, when fresh caught, beats himself against the bars of his cage.

We hoped that the porpoise would soon find out that he had come into the hands of friends, and that he would be well treated; and we trusted that in a day or two he would begin to feed, and take example from the good behaviour of his comrade the sturgeon.

The respirations, or blowings, of this porpoise were something between a cough and a sneeze; elegantly described by a cabman as "one cold caught on the top of t'other." The jet of air he sent forth from his blow-hole, as in the first porpoise, felt warm to the hand.

I had, however, only one fear—the porpoise did not open his eyes once all the time I was looking at him; otherwise, he seemed in perfect health;

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but we did not like to bother and disturb him by examining them.

I wrote a short notice in the *Times* to call the attention of the public to this porpoise in the sturgeon's pond, thinking that there was a good chance of his living:

It seems a very curious thing, but *it is a fact* that all the live porpoises that we have had at the Gardens have done very well, and shown every possible sign of good health and longevity, *till* I wrote to the *Times* to give notice to the public of their arrival. The notice *being published*, the various porpoises have invariably had their spite out against me by dying *immediately*, and this without due notice to their lawful proprietors—a most unwarrantable act on the part of beasts about whose well-being we all cared so much and took so much trouble.

This third porpoise (from Lincolnshire) was no exception to the above rule, for he lived several days, and then immediately he was announced in the “fashionable arrivals” columns in the daily papers he died forthwith, and thus disappointed many a visitor who came expressly to the Gardens to see him.

Among the disappointed visitors was the late lamented Mr. Thackeray, who in *Punch* a few days afterwards published the following admirable

ELEGY ON THE PORPOISE.

BY THE STURGEON.

Dead is he? Yes, and wasn't I glad when they carried away his
corpus;
A great, black, oily, wallowing, wallopping, plunging, ponderous
porpus.

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What call had Mr. Frank Buckland, which I don't deny his kindness,
To take and shove into my basin a porpus troubled with blindness?

I think it was like his impudence, and p'raps a little beyond,
To poke a blundering brute like that in a gentlefish's private pond.

Did he know as I am the king of fish, and written down in histories

As meat for his master, that is to say, for Victoria the Queen,
his mistress?

And, if right was done, I shouldn't be here, but be sent in a water parcel

To swim about in a marble tank in the gardings of Windsor Castle.

And them as forgets the laws of the land which is made to rule and control,

And keeps a royal fish to themselves, may find themselves in a hole.

Is a king like me, I humbly ask, to be put in a trumpery puddle,
For Fellows to walk about and spy, and talk Zoological muddle?
And swells to come for a Sunday lounge, with French, Italians,
and Germans,

Which would better become to stay at home and think of the morning sermons.

And then of a Monday to be used in a more obnoxious manner—
Stared at by rags and tags and bobtails as all come in for a tanner;

And me, the king of fish, indeed, which it's treating china like delf.

Mr. Kingfisher Buckland, Sir, I think, you might be ashamed of yourself.

And then I can't be left alone, but you come and stick in a big Blind, blustering, snorting, oily beast, which is only an old sea pig.

I'm heartily glad he's dead, the pig; I was pleased to my very marrow,

To see the keeper wheel him away in that dirty old garding barrow.

And though it was not flattering, last Sunday as ever were,
To hear the swells as had read the *Times* come rushing up for a stare,

And crying bother the Sturgeon, it's the Porpus I want to see,
And going away in a state of huff, because there was only *me*,
It was pleasant (and kings have right divine to feel a little malicious)

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To see 'em sent to behold his corpse in the barrow behind the fish-house.

So when Mr. Buckland next obtains a porpus as wants a surgeon,

Perhaps he won't insert that pig beside of a royal sturgeon.

I've heard the tench is a cunning fish, and effects a perfect cure
Of other fish put into his pond, which he's welcome to do I'm
sure ;

But don't bring sick porpuses up to me, I'm kin to the old sea
devil,

And though a king, I'm not inclined to be touching fish for the
evil.

Besides, a porpus isn't a fish, but a highly-developed man—

Improved, of course, with a tail and fins, on the famous Westiges
plan—

The Phocænor Rondoletii, though his scent in sultry weather

Was not like Rondoletia nor Frangipanni neither ;

But that is neither here nor there, and, as I previously said,

From the bottom of both my heart and pond, I'm glad the
porpus is dead.

THE STURGEON.

Royal Zoological Gardens.

The elegy quoted above did our porpoise cause an immense amount of good, for it caused residents at the sea-side to be quite anxious to get a live specimen for us, and both Mr. Bartlett and myself held ourselves in readiness to start at any moment to any place at a reasonable distance in the United Kingdom, if only we could be certain of our object, viz. a live porpoise for the Gardens.

At last one morning, while sitting at breakfast, Mr. Bartlett rushed in with a telegram in his hand. "Read that," said he. I seized the paper and read :—"From——, Blackpool, Lancashire, to A. D. Bartlett, Esq., Zoological Gardens. How much will you give for a young, live spouting whale, uninjured ?"

"What's to be done ?" said I ; "it's a grand chance this ; but let us examine the message

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again." "Well," said Mr. Bartlett, "I will go if you will." So we looked at the big map of England and the "A B C," and from these we learnt that Blackpool was some 228 miles from London. Nevertheless, we sent for a cab, and in a few minutes were dashing away northwards in the express from Euston Square.

"I wonder how big this whale is," said I. "How in the world are we to bring him home?" said Bartlett; "we have got a famous whale-pond at the Gardens, and we are promised a Beluga, or white whale, from America. I should be glad if we could get one before Mr. Barnum could send us over a Yankee whale." "I think we had better bring him home in the steamboat from Liverpool," said I; "but it is a longish voyage, as I see from Bradshaw, of something like ninety hours. I think we must risk the train, and travel by night, for the sake of coolness. Where shall we get the proper supply of water for the journey? I wonder if anybody will insure the whale's life before we start," etc.

With such speculations as these, we whirled away through the air, and in the evening, after a long journey, we arrived at Blackpool. We at once inquired anxiously about the whale that was to be seen. "Whale, sir? I ain't heard nought about t' whale." So, ascertaining that the sender of the telegram lived some three or four miles off, we began to seek for the whale up and down the town for ourselves.

Passing by the bath-house on the sea-shore, we saw a crowd at the door. "That must be the

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whale," said I; "they would be sure to put him into a bath when they caught him, and the people are crowding to see him." So we came to the door, where a loud voice was shouting, "The cub whale, caught yesterday! The whale, the cub whale to be seen alive—alive! Sound the gong, Jim. Walk up, walk up! Only twopence to see the monster of the deep!" We elbowed our way through the crowd along a passage to a bath-room; and when we got in, after much pushing, we saw a *poor little baby porpoise*, about two and a half feet long, floating at the top of the water, every now and then showing the white side of his body, and three parts dead. "What a sell!" said Bartlett. "What a sell!" said I. So we got into the open air, threw up our hats, lay "supine" (like the bad shepherd in the Latin grammar) on the shingle, and laughed at each other for five minutes, that we, the porpoise hunters, should have come over 200 miles to see such a wretched creature as this showman's whale.

So we went back to town again, crestfallen; still, however, determined, though we had been made fools of by this our fourth porpoise, never to give up our idea.

The fifth porpoise was a little wretch, exactly like the "Blackpool cub whale," a young sucker; and finding that it would suck his finger, Mr. Bartlett sent for a baby's feeding-bottle with a teat to it, and placed it in the young thing's mouth. He began to suck away famously, and in a short time swallowed over a pint of cow's milk. When the keeper came to feed his charge next

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morning, he found it at the bottom of the bath, quite dead; the probable cause of death being, possibly, that nobody had sat up all night with it to keep the tender infant duly supplied with food.

At length we received news of our sixth porpoise, and the following events took place :—

Late on the evening of Nov. 22, 1863, I received a telegram from John Minter, Esq., Folkestone, stating that he had obtained a live porpoise, which was quite at my service for the Zoological Society. I went down by a fast train early on Monday morning to Folkestone, fully determined to try my very best to bring the creature alive to London.

On my arrival at Folkestone I was welcomed by J. Minter, Esq., and by W. Earnshaw, Esq., who had kindly built a tank for the porpoise, filled it with sea-water, and deposited him therein with a sentry to keep watch and guard, and supply fresh water continually, till such time as I should arrive to take him away to London.

I at once saw that it was a very fine beast (not a fish, recollect), and seemed in a pretty good state of health, or, as Hall, the man who caught him in his sprat net, said, “Look at him, sir, he is as nice a young fish as ever came out of the sea—only just watch his hactions, sir, he is as cheerful as a kitten; I think he is *more* frolicsome since he has been in the tank than he was when I first caught him in my sprat net. Live out of water, sir? in course he will; I only wish I could live as long *under* the water as yon fellow can live out of it in the air—wish you luck with him! The

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London folks don't often see such a beautiful beast as that, sir."

Looking pretty close at the water in the tank, I observed that even though it had been frequently changed it had a blood-red tinge about it; so I lifted up the porpoise out of the water, and saw at once that he had rubbed the bark of the tip of his lower jaw, and that it was bleeding away just as a man's chin bleeds when he has cut himself in shaving.

"This hæmorrhage will weaken the beast," thought I; "it *must* be stopped." So I ran off to a chemist's shop, and got a pennyworth of stick-caustic or nitrate of silver, and, lifting the porpoise's head gently out of the water, applied the caustic freely to the wound. The smarting of the caustic made the porpoise waggle his tail briskly, like a duck just come out of the water on to the edge of a pond: but the bleeding at once stopped then and there, and this was what I wanted.

Knowing that it was not advisable to take the porpoise to London in a tank containing water, because the water splashes down the blow-hole and has a tendency to choke him, Mr. Earnshaw, at my request, kindly ordered his carpenter to knock up a rough box, which, by the way, when finished, looked amazingly like a coffin, and we brought it down to the place where the porpoise was blowing away like a steamboat ready to start. We then wetted some blankets with sea-water, obtained a huge can of sea-water and a big sponge, and we were all ready for the start.

A few minutes before the train left the station

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we hoisted, with the aid of a number of fishermen, the porpoise bodily out of the tank, put him on the blankets in his box, and trundled him off to a fish truck in the station. Mr. Barnett had provided us with a guard's van, and in we bundled, Tennant, myself, and the porpoise. I sat at the end of the box, close to the sea-water tank, so as to have good command of our sea-pig; and lucky it was I did so, for soon after the train started the porpoise was "taken worse," and began to breathe very hard. I at once saw the cause, the delicate membranes composing his blow-hole were getting dry, and would not close properly, so I set to work with the sponge, and the whole way up to London kept on perpetually wiping and sponging the beast's nose and body with the wet sponge, so anxious was I that he should live.

The train went very fast; and in order that the porpoise should have all the air possible, I opened all the windows and shutters I could get at so that there was a perfect hurricane blowing through the van where we three—happy trio—were ensconced in the semi-darkness, having only my little hand-lamp, which I always carry when likely to have to travel by railway at night. This letting in the draught was evidently a good plan for every part of the journey, save and except the long tunnels.

When we got into these, the steam and smoke from the engine came in through the open windows, got down into the porpoise's blow-hole, and made him snort and sneeze to such a degree, that I became positively alarmed for his life. His re-

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spirations increased from nine to fifteen in a minute, and I thought he was going to die then and there. Once out of the tunnel, he got better again, and the faster the train went the better the porpoise seemed to breathe. He had doubtless never travelled so fast before in his life, even though he can swim at the bows of an ocean steamer going at her full speed.

In about two hours and a half we ran into the London Bridge Station, and right glad I was, for I was tired enough, sponging and watching the creature so incessantly. Mr. Bartlett had sent a light cart with a fast-trotting horse for us; we therefore whipped the porpoise, box and all, into the cart, and away we went through the London streets like a fire-engine going to a fire. When we got to Cumberland Market, Regent's Park, I was lighting my pipe, when I dropped by accident a vesuvian on the porpoise's back; this made him jump up and roll round in his wooden cage like a "jack-in-the-box." "He's a-going, sir! he's a-going!" said the driver. "No, he is not a-going," said I. "You go along smartly with the cart, and attend to the horse; leave the porpoise to me. 'You have not got many yards to go now.'"

Arrived at the Zoological Gardens, we drove straight to the reservoir, where the water was deeper than the sturgeon's pond—we did not want another poetical jobation in the columns of *Punch* and the *Times* from the royal fish for intruding on his privacy. The big reservoir would be a much better place, we thought, and so we drove the cart as near as we could to its edge. We then

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lifted out our porpoise—he was “very bad,” and breathing much too fast to please me: we carried him up the reservoir, Bartlett at his head and I at his tail, and let him slip slowly down the bank, tail foremost, into the water. It was pitch dark, and I could hardly see what I was about. The mud was up to one’s knees, and it was raining hard and very cold. I knew, however, by the splash that the porpoise was all right in the water. We then sat down and watched our friend by the help of the policeman’s lantern, and in about half-an-hour he seemed so much better (though occasionally turning over and showing his white sides), that we went away to bed quite tired out.

The next morning I was much pleased to hear that our porpoise was doing very well, and seemed better. Both Mr. Bartlett and I agreed that he was weak from want of food, but how to feed him was the difficulty. Mr. Bartlett suggested a fish tied by string to a pole. I, immediately acting on this idea, sent for my jack trolling-rod, line, and spinning-tackle, then, taking a fresh herring, tied it by the tail to a fine bit of thin silk, and attached the other end of the silk to the spinning-tackle—of course without any hooks. I then judiciously spun the herring right in front of the porpoise’s nose. To our great delight, he took it in a moment, with a snap like a jack, and sailed away with it in his mouth. I gave him plenty of line (as in gorge-bait fishing for jack), and he ran it out famously. I gave him some three or four minutes’ time, and then jerked suddenly upon the line. Mr. Bartlett’s plan acted admirably, and just as we wanted it to

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act, for the silk broke short off, and the herring remained in the porpoise's mouth. The porpoise then chumped and gnawed at the fish but could not swallow it, he was too weak to get it down, and dropped it to the bottom of the pond. We then cut a smaller bit of herring; he attempted to gorge this also, but, as with the larger fish, he could not swallow, and dropped even this little bit. We then tried with a small live carp, which we tied with thin silk on by the tail in the same way as the herring. Strange to say, he would not attempt to bite at the carp, as though he knew it was not a salt-water, but a fresh-water fish and "no good" to him.

The porpoise took seven or eight baits of different kinds from us in this way, but not one would he *swallow*; he dropped them all after munching them a bit between his teeth. Upon consultation, therefore, we determined, that as the beast was too weak to swallow of its own accord, we would help him; so I got down by a ladder into the reservoir, and, catching the porpoise by the fin as he passed, watched my opportunity, and pushed a herring with my hand right down into his stomach; he scored my hand with his teeth, but I did not care about that. For a minute or two after I had given him the herring he seemed better, but he very soon showed that his supper did not agree with him, for he began to flutter his tail and dance about at the top of the water.

After sundry efforts, he made a spring, spat up the herring, and then—ungrateful wretch! after all the trouble and labour we had bestowed upon

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him, turned up his fins and died right off. The cause of his death was, I believe, the herring sticking in his throat as he ejected it from his stomach, and so suffocating him. If he had left it in his stomach where I put it I don't think he would have died.

THE GAMEKEEPER'S MUSEUM

MUCH has been lately said and written upon educational subjects, and particularly upon the formation of local museums.

There exist, however, unnoticed and despised, in most counties, local museums, which will, if carefully examined, yield the most instructive information to those who take interest in the history of the animals now indigenous to England; animals whose representatives were co-existent with the ancient Britons; nay, many of them, as testified by the bones found in the caves of Kirkdale, in Yorkshire, "flourished" (as the school-boy books have it) even in the days when Elephants, Bears, Wolves, Tigers, Hyænas and the great Rhinoceros roamed our broad acres, the undisputed inhabitants of this island.

As the cave bones are to the Geologist and the Palæontologist evidences of existence of the animals of what is generally called the antediluvian period, so does the "Gamekeeper's Museum" inform the naturalist that there are yet representatives of the ancient wild animals in existence in our woods and fields; and that although "man's hand has been against them" for many centuries, yet he has not

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utterly exterminated them from the face of the earth.

There is hardly an estate in England where the gamekeeper has not formed such a museum, or "larder." He selects generally the wall of a barn, or dog-kennel, or a tree near the house, as its site. He is the sole collector, preparer, and conservator of it. His business is to kill and destroy all the enemies of his special charge, the game. He does so, and nails or hangs up his collection—the heads of cats, hawks, owls, hedgehogs, stoats, weasels, and other so-called vermin, thereby demonstrating his power of field-craft and his diligence in preserving his master's property.

But lately I came across one of these rural museums, belonging to a friend of mine, on an estate not far from Brighton, where I had gone on a professional visit, and had half-a-day to look about me after attending to my patient. Three years it had taken the honest gamekeeper to form his collection; and not a little proud of it was he. The vermin, as he called them, "*had lately got scarce*," and all the heads and bodies hung up were perfectly hard and dry.

The victims in our gamekeeper's museum had not been nailed up by chance in the first vacant place, but arranged with a certain degree of taste, a row being apportioned to each species of animal.

The keeper's greatest enemies of course occupied the most prominent position; and in the top row no less than fifty-three cats' heads stared hideously down upon the visitor. There was a story attached to nearly each head; this cat was killed in such a

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wood, this in such a hedgerow, some in traps, some shot, some knocked on the head with a stick.

The cat has numerous muscles about her face, and she is capable of assuming numerous expressions. Let the reader nurse a cat on his lap, tickle her nose, ears, eyes, whiskers, etc., he will see what I mean. Above all, she cannot bear her whiskers to be touched or pulled; at the end of each of these stiff hairs is a large bulb of nervous substance, which converts them into the most delicate feelers. They are of the greatest use to her when hunting about in the dark: in the Lion these nerve-bulbs at the end of the whiskers are as large as small peas.

There is yet another head in the museum from which we can read another history; it is that of a poor little puss who had died before she had attained the age of cathood. Her young life had probably been knocked out of her tender body with a stick; for her head still retains the playful look of the kitten; and there is a sort of a "what-have-I-done-look" about it, as though she had died with submission, and in ignorance of the keeper's anathema against her species.

I would remark that personally I have no antipathy to cats. I rather like them. I am now writing of them only in their character of vermin. Many persons dislike cats and other destructive animals because they are so blood-thirsty towards their fellow-brutes; but that one kind of beast should eat another, is a bountiful law of nature which I cannot now go into. The following verses have been given to me; they were composed by

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Canning, after he had heard a discussion on the subject of animals killing and devouring one another.

Tell me, tell me, gentle Robin,
What is it sets thy breast a throbbing?
Is it that Grimalkin fell
Hath killed thy father or thy mother,
Thy sister or thy brother,
Or any other?
Tell me but that,
And I'll kill the cat.
But stay, little Robin, did *you* ever spare
A grub on the ground, or a fly in the air?
No, that you never did; I'll swear.
So I won't kill the cat
That's flat!

But why have all these cats been killed? It is unfortunately impossible to convert woodland coverts into caged happy families where cats will live in harmony with birds, and their co-existence in amity is incompatible with the law of nature. The master of our covert is jealous of the cat's destructive powers, and naturally applies the law of force to maintain his right to kill and destroy; hence this feline Golgotha. Let us hear what our friend the keeper has to say on the subject; he will tell us that the cat is the worst vermin in existence, for although not hungry, she will kill for sport, and if an old she-cat should lay up her young in the woods, it is incredible the amount of game and rabbits she will destroy.

"Prove the keeper's sweeping accusation against the feline race," says Pussy's friend. "Do they not prowl by night? How does the keeper know they do such mischief?" Alas, for the counsel for Pussy's defence! Let him go the rounds with the

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keeper in the morning, and under the warm shelter of a wall or bank, and even occasionally in the very middle of the rides and paths, shall he find the skins of fresh-killed rabbits turned completely inside out ! a sure sign that the diner-out was of the feline genus. " And why might not the rabbit have been slain by a fox, weasel, or other animal ? " says Mr. Counsellor for the feline defendant. " Because," answers the keeper, " every animal has his own way of killing and eating his prey." The cat always turns the skin *inside out*, leaving the same reversed like a glove. The weasel and stoat will eat the brain and nibble about the head, and suck the blood. The fox will always leave the legs and hinder parts of a hare or a rabbit ; the dog tears his prey to pieces, and eats it " anyhow—all over the place " ; the crows and magpies always peck at the eyes before they touch any part of the body.

Again, let the believer in the innocence of Mrs. Puss listen to the crow of the startled pheasant ; he will hear him " tree," as the keeper calls it, and from his safe perch up in a branch again crow as if to summon his protector to his aid. No second summons does the keeper want ; he at once runs to the spot, and there, stealing with erect ears, glaring eyes, and limbs collected together, and at a high state of tension, ready for the fatal spring, he sees—What ? the cat, of course, caught in the very attitude of premeditated poaching.

Again, let him listen to the tale of destruction, and learn how such and such a " nide " of young pheasants fell victims to his neighbour Turnip-tops'

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"Black Tom" in broad daylight, the "Black Tom" aforesaid never of course having been known to poach before. Let him pay due deference to the keeper's opinion that to the cats alone he owes the loss of many a pheasant's nest. He is certain of his fact because the pheasant's eggs are all out of the nest, and scattered along in a line directly opposite to where the cat made her advance, the sitting bird having in her hurry and flutterings to escape swept her eggs out of the nest, for a foot or two along the track she had taken; just as if the reader should strike a pack of cards placed flat upon the table with his hand, driving them forwards in a line with his blow.

At Castle Forbes, in Ireland, last spring, the gamekeeper was in the habit of seeing every morning nearly a dozen young rabbits sunning themselves close under his window. Suddenly they disappeared. He went and looked round, and found the remains of one rabbit half pulled into a hole at the foot of an old tree; he instantly put a trap down, and caught successively an old she-cat and four young ones. The old she-cat he recognized as the cat belonging to the kitchen at the castle, which had been missing for a week or two previously.

It is unfortunate for cats in general, that if one of their race once takes to poaching, their nature prompts them to continue these evil ways. They find out that game is better eating than rats and mice; they leave the homestead and take to the woods; thenceforward becoming perfectly useless in the domestic economy of the farmer or cottager. So strong is this passion for hunting when once

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acquired, that it is impossible to break them of it. We once knew of a cat against which sentence of death had been recorded, but the owner begged its life on condition that it should be shut up every night and well fed. The very first night of its incarceration, it escaped up the chimney, and the following morning astonished the eyes of the game-keeper as the soot-begrimed occupier of one of his traps. Feed the cat as much as you please, make a pet of it, etc., you will never break it from night hunting, though you may succeed in stopping its *diurnal* rambles.

It is quite wonderful to see a cat jump down heights. She never seems to hurt herself, or to feel giddy with the fall; she always falls on her feet, and these are so beautifully padded that they seldom or never get broken. I never knew of a cat breaking its leg from an accident, but in one instance, and that was a *French* cat, which fell down stairs in the most stupid manner. Why does not the cat get a headache after her deep jumps?—why does not she get concussion of the brain, as a man or a dog would, if he performed a similar acrobatic feat? If we take down one of our dry cat's heads off the keeper's museum wall, and break it up, we shall see that it has a regular partition wall projecting from its sides, a good way inwards, towards the centre, so as to prevent the brain from suffering from concussion. This is, indeed, a beautiful contrivance, and shows an admirable internal structure, made in wonderful conformity with external form and nocturnal habits. Apropos of feline skulls, I may here give the lesson I learnt

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from Professor Quekett, of the Royal College of Surgeons, as to how to tell a Lion's skull from a Tiger's skull; for, when placed side by side, there is not much perceptible difference between them. All that is required is, to remember that the word "Level," as well as the word Lion, begins with the letter L. In the lion's skull the points of the four bones, which form the nose part of the face, are *on a level* with each other. In the tiger's skull, on the contrary, the points of the two central bones run higher up the skull than the two outside ones.

A facetious young urchin, at home for the Christmas holidays, knowing well the love cats had for valerian, once played an old lady a pretty trick. He put some of this plant under the hearth-rug one evening; puss soon found it out, and began scratching and rubbing her back upon it, and then getting up and dancing about, till the poor old lady got frightened, thinking the cat was suddenly possessed. The valerian was quietly taken away, and puss recovered her self-possession, which confirmed the old lady in her original opinion.

Not a single head of a genuine wild cat did we see in the museum—they are now nearly extinct; all the heads are those of house cats. The wild cat is the only species of the family which is indigenous to the British Isles. It is now almost entirely restricted to Scotland, some of the woods in the north of England, the woody mountains of Wales, and some parts of Ireland. It is necessary to guard against confounding the wild cat with numerous instances of escaped domestic cats,

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returning to a state of almost absolute wildness, breeding in the woods, and feeding on birds and quadrupeds. The assertion that the wild and domestic cat will breed together, I believe to be absolutely without foundation. The head of the wild cat is triangular, strongly marked; the ears rather large, long, pointed, and triangular; the body strong and rather more robust than that of the domestic cat. The tail is of equal size throughout its length, or rather larger towards its extremity. I learnt, when a little boy, from my father, that the common cat was brought over here from Italy by the Romans; and that a wild cat's tail ends in a tuft, as if it had been chopped off with a hatchet on a block; whereas the common cat's tail ends in a point, and tapers to a point as if it had been gradually drawn out of the body.

At the village of Barnborough, in Yorkshire, there is a tradition extant of a serious conflict that once took place between a man and a wild cat. The inhabitants assert that the fight commenced in an adjacent wood, and that it was continued from thence to the porch of the church, where each died of the wounds received. A rude painting in the church commemorates the event; and the red tinge of some of the stones (though probably natural) has been construed into blood stains, which all the soap and water hitherto used have been unable to efface.

In the time of Richard II., A.D. 1377, wild cats were reckoned among the beasts of the chase, and there was an order that no abbess or nun should use more costly apparel than that made of lambs' or

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cats' skins. What would the abbesses have said to the beautiful North American Sea-otter's skin, now worn by English ladies ?

But a few minutes after my inspection of the museum, I saw a house cat out in the open fields, creeping, as only a cat *can* creep, up a hedgerow ; evidently she had not seen the Golgotha of her species, or she would have remained at home, warming herself by the fire. Many a poor old woman has wondered, as only an old woman *can* wonder, what has become of "our Puss." The keeper could, if he liked, answer her question, pointing triumphantly to his museum : "There she is on my barn-door, executed for a poacher." But in all probability the old lady never once divined that the reason why her poor puss slept so soundly all day, and dozed so lazily in the window, was because she had passed the previous night in the game preserves.

The heads of dogs are seldom seen in the keeper's museum. He generally buries them. If an Englishman is persecuted and followed by a yelping cur, he can generally manage to get rid of him by stooping down and pretending to pick up a stone, for all curs have a mortal dread of a thrown stone ; but on the bogs of Ireland the dogs don't care a bit if the person they are barking at pretends to pick up a stone ; they know, cunning brutes, there are no stones on the bogs to be picked up and thrown at them, but they act very differently if there happens to be a heap of stones anywhere handy. It is an unpleasant situation to be attacked by a dog ; if you are so circumstanced, never attempt

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to run, try throwing a stone at him, or present your hat in your hand, and when he has seized it, hit him with a stick across the *nose* or *fore leg*. These are the most vulnerable points in a dog; a blow on any part of the head but the nose won't hurt him a bit.

If a dog comes up to you and growls, and won't be friendly, don't withdraw from him; put on a bold face, and stretch your hand towards him, keeping it quite still (if you withdraw it after stretching it out he will bite you); the dog will come up and smell the hand, and, having once done this, will be your friend for life. A chimney-sweep once made a match to fight a bull-dog single-handed, armed only with his brush. He entered the arena with his brush in one hand and a foot of bramble bush covered with thorns in the other. The dog sprang at him; he presented the bramble bush to the animal, who seized it in his mouth, and so got hooked by the thorns on it; the chimney-sweep belaboured him over the head and nose with the back of the brush, and won the match. We may learn from this, that if a man is attacked by a bull-dog, he should hold out a stick between his hands, and present it to the dog, who will seize it, and give the man time for further measures. A rat-catcher lately told me that he had a monkey that would be "a match for any dog in any pit." The monkey was given a short, stout stick; he watched his opportunity, sprang on the dog's back—it was impossible for the dog to throw him, and the monkey beat him about the head at his will.

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Dogs, like cats, sometimes run wild, and nothing is more difficult to kill than a wild Irish dog, hunting by himself, in the bogs or on the open ground. He will always keep well out of shot, and really there is only one way to get near him; and that, it must be said, is a gross imposition on canine confidence. When the dog is seen hunting about, take no notice of him, but pretend to hunt about also yourself; beat the bushes, and cheer lustily: the unsuspecting dog, prompted by his instinct to be of use to man, comes to afford assistance; he is put off his guard, approaches within shot, and is carried off defunct by the keeper.

Underneath the row of cats' heads in the gamekeeper's museum, were deposited dry bodies of the birds; the feathered enemies to the game. There were magpies, jays, owls, crows, and hawks—of the latter, I counted thirteen bodies, principally sparrow-hawks—and kestrels. The keeper called these latter "Fanner Hawks," and a very good name this is, for they swim, so to say, about in the air, surveying with telescopic eye the ground for their food; having discovered it, they remain hovering over it, suspending themselves in the air by means of a rapid movement of their wings, much like a bee when inspecting the inside of a flower. In other parts of England they call these birds "wind hovers," an equally good name, inasmuch as it indicates the habits of the animal as it hovers in the wind, previously to making its arrow-like descent upon the unconscious mouse below.

A great observer of nature, and a clever sports-

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man, told me that hawks have their regular beat, and frequent daily the same line of country, soaring along for miles and miles in quest of prey. So strongly impressed was he with this idea, that he always marked the time and place when he saw a hawk on the hunt, and sure enough the next day would find my friend at the spot, waiting in ambush gun in hand, and consulting his watch, as confidently as if he were expecting a friend by the most punctual of railways. He assured me that he always found the hawk true to his time by half an hour or so, and seldom varying his line of flight by more than a hundred yards.

I saw no heads or remains of the forked-tailed kite in the gamekeeper's museum; it has become nearly extinct in the southern parts of England. When my father was a young man at Oxford, about 1808, these birds were numerous in Bagley Wood, and he frequently saw them sailing about over the Thames, when walking round Christ Church meadow.

I think there were one or two ravens' heads nailed up; these birds are also getting very scarce. I see young ones in Leadenhall Market for sale every year. Last year I bought two; one I sent to a friend, a Prefect at Winchester School, the other is become the "Regimental Raven," and is now hopping about the barrack yard—he is a capital rat and mouse catcher. I gave ten shillings each for them.

The hawks had been killed by the keeper, because they destroy the young pheasants and partridges; the crows, jays, and magpies, because they destroy

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the eggs of the game. If we examine their hard, sharp-pointed, conical bills, we shall see at once what a capital instrument Nature has given these birds, to enable them to fill the position allotted to them in the chain of animal economy. It is a compound of a dagger, a bayonet, and a club; there is no egg hard enough to withstand one peck from its point; there is no rabbit's hide that is proof against its bayonet thrust; nor is any mouse alive after one or two sharp blows, when the bird uses it as a club. I lately turned out a mouse to a tame magpie—the poor little thing ran for his life towards the nearest cover; but mag's sharp eye had seen him, and a few hops soon brought her up to the mouse, just as he was getting under a board. She caught him in her bill, and threw him back again into the open; she then gave him a stab, which made a cripple of him, and knocked out of his tiny panting body with a few blows of her dagger-like beak the little life that remained.

Magpies, if properly trained, can be taught to do the work of retriever dogs, on a small scale. My friend Mr. Blick, of Islip, is in the habit of shooting sparrows in his garden: on these expeditions he is always accompanied by his dog and his cat, who run round him in great delight whenever they see the gun taken down. At the same time, out hops from under the bushes, where he has been hunting for worms and slugs, a pert, impudent-looking magpie, jerking up his long tail, and croaking out "mag, mag," with ten-magpie power. A shot is fired at the unsuspecting sparrows, who are filling their little crops with the corn spread out to delude

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them into the idea that they are welcome visitors to the yard. A shot is fired, a victim falls lifeless to the ground; up rush dog, cat, and magpie, each anxious first to secure for themselves a dainty morsel. It is a good race, but the magpie generally gets in first, and seizing the panting bird, hops off with it underneath the dense shrubs, closely pursued by the dog and the cat, who are obliged to look on patiently at their more successful competitor, the magpie, who is now picking off the sparrow's feathers and throwing them down, as if in mockery, on the heads of his rivals, the said rivals being unable to reach him, his natural sagacity having suggested to him the propriety of taking up his position on a twig, just too high for the dog to reach by jumping, and too slender to bear the weight of poor disappointed puss.

Magpies have always been connected with some superstitious stories; even the peasants of Norway say they have to do with witches: and who does not know the old rhyme about magpies, so often quoted by good folks setting out on picnic expeditions? A magpie appears alone, or in company, and immediately somebody says:—

One the sign of sorrow,
Two the sign of mirth,
Three the sign of a wedding,
Four the sign of a birth.

I do not know what the French peasants think of magpies, for all along the railway from Boulogne very nearly into Paris, I saw a magpie's nest in almost every tree—their numbers in this case certainly proved prophetic, for I was on the road

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to a wedding at Paris. It is often said, that it is unlucky to rob a magpie's nest; it is a fact, that when this has been done, the parent-birds become more destructive to the hen-wife's poultry than they were before. Magpies are often taught to talk, and it is very curious that they pick up the accent of their teacher. Outside the cottage of a Berkshire villager, I espied a fine magpie in a cage, and he began talking away in as broad Berkshire as ever I heard. I also recollect a German student, who said he could talk English; he certainly could say a few words, but he spoke with a broad Yorkshire accent; he had picked up the accent from a Yorkshireman, his fellow-student. I may here say, that it is no use whatever, as is often supposed, to split the tongues of these birds in order to give them facility of speech. It is cruel work, and does no good. Magpies can talk sometimes even better than men. I was told of a conceited young gentleman who naturally stammered, coming up to the owner of a magpie, who was a working man, and after rattling the bars of the cage with his gold-headed cane, he said, "I say, my man, can your mag-mag-mag-pie t-t-t-talk?" "Yes," said the man, "a precious deal better than you can, or I would wring his neck on the spot."

As the museum was situated near the sea-coast, I was therefore not surprised to see in the collection a Royston, or hooded crow. This bird's proper home is the sea-shore, where his business is to follow the retiring tide, and to eat what is left thereby. Nor does he object to small crabs. Having capital wings, he often takes a look at the

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rocks, where the gulls and other sea-birds build their nests and place their eggs. When these fail him, he will take an inland journey, and very naturally mistakes a game bird's egg for a gull's egg. The keeper, in his turn, very naturally seeing what he is after, mistakes him for a carrion crow, shoots and gibbets him—hence his appearance in the museum. The keeper calls him the saddle-back crow; a good name again, for his head, tail, and wings are black, and the rest of his body of a fine ash-grey colour, so that he looks very like a common crow with a saddle on his back. Our French neighbours too, whose shores he also visits, have evidently, with the same idea, christened him *corneille mantelée*, or crow with a cloak on. These crows are very quick in finding out dead or wounded birds. A great sportsman tells me that he has often gone at daylight, to pick up wild fowl which he had shot the previous evening, and found that these saddle-back crows had anticipated him, and made a meal of his wild ducks and teal.

In Ireland these birds are called "Scalcrows," and they are very numerous, frequenting chiefly the vicinity of the larger lakes and rivers. Having never had an opportunity of comparing the Royston crow of England with the Scalcrow of Ireland, though it is most likely that they are the same species under a different name, I cannot pronounce an opinion why in the sister country they appear to be far more destructive and formidable enemies to game than they are in England. In Ireland a pair of scalcrows will hunt a moor or bog, and quarter the ground as regularly as a brace of well-

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broken pointers; and woe to any brood of grouse or young leveret they may find. Nothing comes amiss to them. The old hen-grouse in vain sits close on her nest. The scalcrows persecute her, and hover round and round about her, alight, and fairly beat her off their luxurious banquet of egg omelet. On an Irish bog they are without exception the worst "vermin" the gamekeeper has to contend with.

Even in England, game-eating and egg-destroying birds are very wary, and difficult to get near with a gun. The best way, therefore, of ridding the covert of them, is to poison a dead rabbit and place it in their way; they quickly find it out, peck at it, and suffer death in consequence. At Castle Forbes, the keeper has picked up as many as twenty-one magpies and crows to one rabbit at one time, and seven magpies and seven carrion crows at another; but this did not last long; somehow or other the cunning birds found out that it was dangerous to peck at dead rabbits; in vain therefore were they laid down; the crows and magpies were for a season triumphant. But their enemy, man, was more cunning than they; he shot some wood-pigeons, poisoned them, down came the less cunning birds, and not suspecting treachery in a wood-pigeon, though they knew it was present in a rabbit, they pecked, and died. Strychnine, the most deadly poison made use of, is mostly sent to Australia, where it is used by the colonists for killing the dingoes, or native wild dogs, also the eagles, hawks, and vermin of that wonderful continent. The colonists have remarked the

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peculiar effects of this poison on the creatures who eat it. An eagle has been seen to peck at the poisoned bait and then soar away; in the midst of his flight the poison has taken effect, the bird falls swiftly to the ground, and, in a very short time, the body becomes perfectly rigid and set, preserving, when dead on the ground, the beautiful attitude of flight peculiar to this splendid bird.

I saw no trace of an Eagle in the museum, but still these birds sometimes come very far south. When we were quartered at Windsor, in 1856, an eagle was shot in Windsor Forest, and I then sent the following account to *Household Words*.

“The Royal Forest of Windsor has lately been honoured by a visit from a royal bird. The Eagle of the north visited the domains of the Queen of the south. The particulars are as follows :—

“On the afternoon of the 12th of December last, as one of the officers of the garrison of Windsor was riding in the great park, not far from the statue of King George III., at the end of the Long Walk, he was surprised to see a large bird on the ground, gorging himself with a rabbit. He advanced towards it, but the bird flew up into a tree. When on the tree it appeared to have a chain round its leg, but this was afterwards ascertained to be a portion of the rabbit it had just been eating. The pursuer having clearly made out that this large bird was an eagle, a most unusual visitor to the Royal Forest, rode off immediately to the keeper's lodge with the news. The keeper, while mounting his pony, stated that the bird had been seen about the forest for four or five days, but had always kept

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out of shot. When they both got back to the place where the bird was sitting, the keeper concealed himself and his gun, while the officer rode round the bird, endeavouring to drive him over the ambush. Off he went at last, but flew wide of the keeper. Then came the riding part of the business, partaking more of the character of a steeplechase than of hunting. By dint of hard and difficult galloping among rabbit-holes, thick ferns, and open drains, the eagle was again marked down in a clump of trees. Then followed a little stalking. The keeper on his pony and his companion on his horse advanced carefully, but the cunning bird would not allow them to come near. The keeper then got off his pony, and walked alongside the horse, which was of a grey colour, and seemed not to alarm the bird so much as the pony, which was of a dark colour.

“After a few steps, the keeper suddenly and quietly glided behind a tree, and the grey horse and his rider advanced farther. To divert the attention of the suspicious bird, the latter wisely made as much noise as he could, tapping the saddle with his whip, riding among the thick ferns, and pretending all the careless unconcern he could assume. In the meantime the keeper got near, and fired both barrels. The bird flew away, but had been evidently hard hit, for his flight was laboured and near the ground. He alighted at last on the bough of a young tree, where his drooping wings and fainting form made him look more like an old coat hung up as a scarecrow than an eagle.

“Both the pursuers then rode up, and again,

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although wounded and bleeding, the courageous bird started off, but he could not go far : it was his last flight ; for, in another minute, he dropped dead, shot through the right eye. The former shot had hit him in the body, but had in no way damaged his plumage. Shortly afterwards we inspected this noble bird, and found him to be a fine specimen of the white-tailed Sea-eagle. He measured with outspread wings eight feet ; the length of his body from his beak to his tail was three feet two inches ; and he weighed twenty-two pounds. From his plumage, which was in excellent condition, it seemed probable that he was a wild bird ; there being no marks either of cage or chain to indicate that he had ever been in captivity. His skin has been well preserved in a well-chosen attitude. Three or four years ago a Golden-eagle was shot in the forest, and presented by his Royal Highness the Prince Consort to Eton College."

When at Oxford, I had a tame eagle, which I kept outside my rooms in " Fell's Buildings," at Christ Church ; and my eagle got me into much trouble, as it was an un-academical bird. I was obliged to banish him to the care of Mr. Osman, the bird stuffer, in St. Aldate's Street. When I left Oxford, I took the eagle with me, and, having received a University education, I suppose he thought he must do something in this great metropolis. So he took unto himself wings, and flew ; and that, upon a memorable day in the annals of Londoners. An account of his performances at the time was written by me, and published by a friend of mine ; it ran as follows :—

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"The Chartists and special constables of Westminster, who were preparing on the 9th of April, 1848, for the grand 'demonstration' of the following day, beheld with varied feelings an omen which they interpreted according to their views. A magnificent eagle, suddenly appeared sailing over the towers of Westminster Abbey; and, after performing numerous gyrations, was seen to perch upon the summit of one of the pinnacles. He formed a most striking object, and a crowd speedily collected to behold this unusual spectacle. After gazing about him for a time he rose, and began ascending by successive circles, to an immense height; and then floated off to the north of London, occasionally giving a gentle flap with his wings, but otherwise appearing to sail away to the clouds, among which he was ultimately lost.

"Whence came this royal bird, and whither did he wend his way?

"His history was as follows: Early in 1848 a white-tailed sea-eagle was brought to London in a Scotch steamer, cooped up in a crib used for wine bottles, and presenting a most melancholy and forlorn appearance. A gentleman, seeing him in this woeful plight, took pity on him, purchased him, and took him to Oxford, he being duly labelled at the Great Western Station, 'Passenger's Luggage.' By the care of his new master, Mr. Francis Buckland, the bird soon regained his natural noble aspect; delighting especially to dip and wash in a pan of water, then sitting on his perch with his magnificent wings expanded to their full extent, basking in the sun, his head always turned towards

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that luminary, whose glare he did not mind. A few nights after his arrival at his new abode, the whole house was aroused by cries as of a child in mortal agony. The night was intensely dark, but at length the boldest of the family ventured out to see what was the matter. In the middle of the grass-plot was the eagle, who had evidently a victim over which he was cowering with outspread wings, croaking a hoarse defiance to the intruder upon his nocturnal banquet. On lights being brought, he hopped off, with his prey in one claw, to a dark corner; where he was left to enjoy it in peace, since it was evidently not, as at first feared, an infant rustic from the neighbouring village. The mystery was not, however, cleared up for three days; when a large lump of hedgehog's bristles and bones, rejected by the bird, at once explained the nature of his meal. He had doubtless caught the unlucky hedge-pig (as it is called in Oxfordshire) when on his rounds in search of food; and, in spite of his formidable armour of bristles, had managed to uncoil him with his sharp bill, and to devour him. How the prickles found their way down his throat, is best known to himself; but it must have been rather a stimulating feast.

"This eagle was, with good reason, the terror of all the other pets of the house. On one occasion he pursued a little black and tan terrier, hopping with fearful jumps, assisted by his wings, which, happily for the affrighted dog, had been recently clipped. To this the little favourite owed his life, as he crept through a hedge which his assailant could not fly over; but it was a very near thing,

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for if the dog's tail had not been between his legs, it would certainly have been seized by the claw which was thrust after him just as he bolted through the briars. Less fortunate was a beautiful little kitten, the pet of the nursery,—a few tufts of fur alone marked the depository of her remains. Several guinea-pigs and sundry hungry cats too paid the debt of nature through his means; but a sad loss was that of a jackdaw of remarkable colloquial powers and unbounded assurance, who, rashly paying a visit of a friendly nature to the eagle, was instantly devoured. Master Jacko, the monkey, on one occasion only saved his dear life by swiftness of foot, getting on the branch of a tree just as the eagle came rushing to its foot with outspread wings and open beak. The legend is, that Jacko became suddenly grey immediately after this; but the matter is open to doubt.

“ One fine summer's morning the window of the breakfast-room was thrown open, previous to the appearance of the family. On the table was placed a ham of remarkable flavour and general popularity, fully meriting the high encomiums which had been passed upon it the previous day. The rustling of female garments was heard—the breakfast-room door opened, and—oh, gracious! what a sight! There was the eagle perched upon the ham, tearing away at it with unbounded appetite, his talons firmly fixed in the rich, deep fat. Finding himself disturbed, he endeavoured to fly off with the prize, and made a sad clatter with it among the cups and saucers; finding, however, that it was too heavy for him, he suddenly dropped it on the carpet,

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snatched up a cold partridge, and made a hasty exit through the window, well satisfied with his foraging expedition. The ham, however, was left in too deplorable a state to bear description. The eagle was afterwards taken to London and placed in a courtyard near Westminster Abbey, where he resided in solitary majesty. It was from thence he made his escape on the 9th of April. He first managed to flutter up to the top of the wall, thence he took flight unsteadily, and with difficulty, until he had cleared the houses; but as he ascended into mid-air, his strength returned, and he soared majestically up as has been narrated. After his disappearance his worthy master said with a disconsolate air: 'Well, I've seen the last of my eagle!' but thinking that he might possibly find his way back to his old haunt, a chicken was tied to a stick in the court-yard, and, just before dark, master eagle came back, his huge wings rustling in the air: the chicken cowered down to the ground, but in vain—the eagle saw him, and pounced down in a moment in his old abode. Whilst he was busily engaged in devouring the chicken, a plaid was thrown over his head, and he was easily secured. After this escapade he was sent to the Zoological Gardens, Regent's Park, where he may be recognized by having lost the outside claw of the left foot."

I often had fights with this bird, who was of rather a savage disposition. He once got hold of my leg, and his claws were obliged to be unfastened one by one. It is very easy to handle an eagle, hawk, owl, or other such bird, with sharp talons,

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if you only know how. The brute always strikes first with his claws, and then pecks with his bill. Remembering this,—allow the eagle, hawk, or owl, to clutch something or other, say a broom-handle or a walking-stick; then quickly throw a Scotch plaid, or a blanket, over his head, when you may release the stick, let him clutch a bit of the plaid, tie his legs, and he can be carried anywhere. In this manner I once carried my eagle on the top of an Atlas omnibus, from the Zoological Gardens, Regent's Park, down to Westminster Bridge. He got his head out, and pecked at me in Regent Street, but I soon secured him again. He was furious at being treated in this way; he ruffled up his feathers and looked spitefully at me when I untied his legs and let him loose again, after he had arrived at his destination; but I made friends with him by means of a good lump of beef-steak.

I must now return to the gamekeeper's museum, from which subject I fear I have sadly digressed.

Tastefully arranged in rows were the tails of pole-cats, stoats and weasels. Imagine the strong and powerful smell of these little animals to be quite enough to prevent the keeper bringing them home bodily, as a larger trophy. The mischief done by them to game and rabbits is very great, but they are easily taken, and many fall victims to the gun; for when once seen by the gunner, whether in hedgerow, rabbit-burrow, or thicket, he need only sit still within shot, and by imitating the cry or squeak of a young rabbit, bring the intruder almost up to the muzzle of his gun. Wonderful is it how these little animals kill hares and rabbits, but it

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seems that when pursued by them a rabbit loses its senses, becomes fascinated as it were, and through its simple folly falls an easy prey.

Sucking the blood, and eating merely a portion of the neck and head, and despising the rest of the spoil, the stoat or weasel requires more than one victim for a meal, and hence is doubly destructive. Though so destructive, they are easily trapped, owing to the extraordinary manner in which they stick to *passes* or a certain line of country.

If a keeper once finds out a *pass*, his traps should there remain for ever, and he will clear the country of weasels and stoats; generally they frequent a pass by an old wall, and along a water-course.

The best trap is a little steel trap covered over with a couple of bricks, and four more placed as sides, so as to form as it were the entrance to a drain or a sort of gallery. This, judiciously placed, will not fail to catch any passing stoat or weasel, without any bait whatever.

A friend, a good observer of nature, writes to me as follows :—

“ I will mention one curious instance of the voracity of a stoat. Last March year, at Castle Forbes, my servant was throwing the casting-net in to catch me some live-bait, near one of the coverts, when he saw a rabbit start out, evidently ill at ease; it paused, went on, stopped again, till it got two hundred yards from the covert. Then out came a stoat, hunting on his track, and the rabbit actually stopped, as it were petrified, till the stoat jumped on his back. My servant ran up, tried to kill the stoat with a stick, but it got away



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back to the covert; however, he secured the rabbit, which was slightly bitten on the neck and disabled.

“About half an hour afterwards, within twenty yards of the same place, out came another rabbit in precisely the same way—the stoat following. Again my servant attacked it: the stoat ran between his legs and got into the covert; he secured the rabbit as before. Shortly afterwards I came up to see if my servant had caught me any live-bait, and he was in the act of relating what he had seen, when out came from the same covert a third rabbit, in precisely a similar manner, and hunted by the stoat. My gun was on my arm (as it always is in that wild district), but I let the stoat kill the rabbit, and then I shot him; thus bagging three rabbits, and killing the stoat into the bargain.”

The same gentleman witnessed an extraordinary encounter between a stoat and a cock-pheasant in an open field. The pheasant ran a few yards, then awaited the attack of his enemy; the stoat followed and sprang upon him, and was received with a more vigorous welcome from his spurs. Again the pheasant ran, and the stoat pursued; another encounter, and similar reception. This was repeated half-a-dozen times across the field without any apparent advantage to either side, but our friend had them well within range, and put an end to the combat by shooting Mr. Stoat, and by sparing Mr. Pheasant for the Christmas *battue*.

In our keeper's museum we observed two rows of dead hedgehogs, numbering in all one hundred and thirty. These had been executed for the

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crime of egg-eating. For many years I had upheld the cause of the hedgehog; but I fear the verdict of "Guilty upon the above plea" must be found against him. A hedgehog will eat almost anything. He will eat dead birds, roots (particularly plantain roots), beetles, and slugs. I have often seen the heaps of cow-dung by the sides of coverts turned over. The hedgehog has been at work looking for the beetles and worms which are to be found under them; but I am sorry to say an egg is to him a most savoury feast. A keeper in Wiltshire knew of a pheasant's nest in some long grass; every day he missed from one to two eggs out of it, shells and all. He could not make it out; so when he had time he watched the spot. One day, he saw the tops of the grass in motion towards the nest; it was as if stirred up by some animal running beneath it. The stir in the grass went up to the nest and stopped. The keeper walked up and found the hedgehog with an egg just displaced from the nest; he killed it, and no more eggs were taken.

To make the matter more certain, I lately obtained a hedgehog, and gave him some bread and milk and an unbroken egg. The egg was the first course of his dinner he attacked: upon examining the basket a few hours afterwards, we found the egg entirely gone—not one little bit of the shell was left; he had eaten up every bit of it. This, we think, will fully account for the keeper's not finding any broken shells in the pheasant's nest. On another occasion, I saw the hedgehog open the egg; he bit it sideways with his sharp canine teeth, and made a hole in it just big enough

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to thrust in his little black nose, and then with his tongue licked out the contents, and mightily he seemed to enjoy it, little thinking what evidence he was giving against the rest of his species. The same hedgehog was one day allowed to run about my table, while giving a lecture on him. There happened to be a large ostrich's egg on the table, set in silver, as a holder for cards, etc.; by the strangest coincidence, the hedgehog went up to the ostrich's egg, and smelt at it, just at the very moment I was explaining the experiment with a hen's egg. Whether a jury would admit this as evidence in the prosecution for egg-eating, I am not lawyer enough to say.

A hedgehog will not only eat eggs, but he will also eat flesh; and if he can't find anything dead to eat, he will kill something on his own account. Now, a hedgehog is not a very powerful animal; he therefore of necessity attacks something weaker than himself, such as young partridges and leverets. We will again put a witness of great experience in the box. He was out by a covert side with his keeper, when the terrier dog set at something in a ditch; he heard a terrible squeaking going on at the same time. On turning over the long grass and brambles that overhung the ditch, he found a leveret, about the size of a rat, in the jaws of a hedgehog, palpitating in the struggle of death. The sharp teeth of the hedgehog are adapted equally for catching a small animal, such as a leveret, or for munching up with ease the hard and horny cases of beetles.

Early in the spring, I tried to buy a hedgehog in

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London, but could find one neither in Leadenhall, St. Giles's, nor other animal markets; they were not to be had for love or money. A few days afterwards, the warm weather came, and I found plenty of hedgehogs for sale. The probable reason of this fact is, that the hedgehogs had been concealed in their winter quarters during the cold weather, and, coming out in the warm, had been caught by the dogs of those curious fellows who poke about the hedges near London for snails, snakes, birds' eggs, etc.—all saleable articles in St. Giles's animal market.

At Castle Forbes, in Ireland, there are many hedgehogs; and there they are caught in a box-trap, made of iron bars, called an "iron witch." During the spring of last year, more than fifty of them were caught by one of these iron witches, the bait being always a rabbit's paunch. Like the cats, the hedgehog are very fond of valerian, and, with their sharp sense of smell, soon find out a trap baited with it.

A gamekeeper at Ringwood informed me that he trains retrievers to catch hedgehogs for him, and he goes out at night to hunt for them. He has killed upwards of thirty in one night by trampling on them. (N.B.—Nearly all these animals found in the museum have been thus served, and I always find it most difficult to get a perfect skull from the collection.) The keeper informed me that the hedgehog "eats black-bobs—them great beetle things." The otters, too, have also regular hunting-places, and they have beaten down paths and tracks across the interspace of land about

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two miles between the rivers Stour and Avon. When a trap is set for them, it should have a bit of wood tied to it, and not be fixed; the wood will float in the water when the otter retreats there, and will help to kill him. •

I have often heard that hedgehogs are good to eat, and that gipsies are very fond of them, and that they are great proficient in the art of cooking them. I have lately had the good fortune to obtain information on this point from a high authority. In the neighbourhood of Oxford I met an old gipsy woman, who, although squalid and dirty, was proud in being able to claim relationship with Black Jemmy, the king of the gipsies. She informed me that there were two ways of cooking a hedgehog, and seemed much surprised at my question whether her tribe ever ate them; as if there could ever exist a doubt. I expressed a wish to know the process, the receipt for which I subjoin in her own words: "You cuts the bristles off 'em with a sharp knife after you kills 'em fust, sir; then you sweals them (Oxfordshire, burns them with straw like a bacon pig), and makes the rind brown, like a pig's swcalings; then you cuts 'em down the back, and spits 'em on a bit of stick, pointed at both ends, and then you roasts 'em with a strong flare."

It appears that hedgehogs are sometimes in season, and sometimes out of season. My informant told me that "they are nicest at Michaelmas time, when they have been eating the crabs which fall from the hedges. Some," she added, "have yellow fat, and some white fat, and we calls 'em

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mutton and beef hedgehogs; and very nice eating they be, sir, when the fat is on 'em."

The other way of cooking hedgehogs is gone out of fashion. The gipsy's grandmother used to cook them in the following manner; but it appears they are best roasted. The exploded fashion is to temper up a bit of common clay, and then cover up the hedgehog, bristles and all, in it,—like an apple in paste, when an apple-dumpling is contemplated,—then hedgehog, clay and all, is to be placed in a hole in the ground and a fire lighted over it; when the clay is found to be burning red, the hedgehog is done and must be taken out of the hole; the clay-crust of the pie being opened, the hedgehog's bristles are found sticking to it, and the savoury dinner is ready.

The fashion of eating hedgehogs was not, in former days, confined to gipsies. There was a farmer's family living at Long Compton, near Oxford, who were supplied with hedgehogs by our informant's grandmother; this family used also to breed them, keep and fatten several litters, "and," said the gipsy, "they used to eat up every litter they bred, dressing 'em just when they wanted 'em, like they did the fowls." Sometimes a nest of young hedgehogs is found by the gipsies; if they are too small for eating, they are preserved till fit for use, or, as it is called in Oxfordshire, "flitted"; that is, a string is tied to the hind leg, and the doomed animal is allowed to wander about the length of his tether, picking up what he can get; under this system, if well fed, he will fatten wonderfully.

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It has long been a disputed point as to whether hedgehogs will eat the common harmless snake or not. There is no reason why they should not, as their teeth are sufficiently sharp and pointed both to catch the snake and munch him up afterwards. Again, it might be argued that the snake would be too swift for his bristled enemy, and be able to escape by flight. This is not the case; for, in the first place, the crafty hedgehog might come un-awares upon the snake when basking in the sun; and even supposing the alarm was given, and a pursuit took place, the hedgehog would have the best of the race. It is quite surprising how fast a hedgehog can run, if he likes; all his bristles lie quite smooth on his back, his little legs generally coiled up tight in the centre of his body, and he hustles along at an amazing pace; and, in a fair race in the open, with a fair start (a difficult thing it is to start a hedgehog for a race, as I have tried, the brute will persist in rolling himself up and *not* starting), we would back the hedgehog against the largest snake in England. I therefore determined to try the experiment, whether a hedgehog would really eat a snake or not. I caught a snake near Harrow; and bought a hedgehog in St. Giles's. For several mornings I placed them together on the grass, but they took no notice of each other. The snake never went *towards* the hedgehog, if he could help it; if he had a choice, he went in the contrary direction; but, whether through shyness at my presence, or whether because he was not hungry, the hedgehog never attacked him. At last, one evening, I shut them both up in a box together.

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The next morning, the lid was opened, and the murder was discovered. The hedgehog had, during the night, attacked and eaten half the snake, beginning at the tail. He had not left a single bit of the lower half of the body, and instead of the fine active snake I had put in in the evening, I found only half a snake was left; just as if he had been cut in two with a knife, and the lower half taken away. As the hedgehog had begun his meal, I thought I would allow him to finish it, which he did in a very few hours. We must at the same time be guarded against the conclusion that we are dealing with a great serpent slayer; and a little reflection upon the habits of the individuals in question will tend much to set us right upon this point.

The snake loves the sun, the hedgehog is a nocturnal animal; he is very seldom or never seen out looking for his food before the sun is down; he then comes out of his den, and begins hunting for beetles and worms—particularly the big lob-worms that come out of their holes to enjoy the dew of the evening, as every fisherman well knows. If he came out in the daytime, he would find no worms, and but very few beetles, even if he were to look for them, which, by the bye, he would have some difficulty in doing, as his eyes are of a dark colour, and more suited for twilight than sunshine. The snake, on the contrary, comes out only in the heat of the day, to bask in the sun, or hunt in the shade of the long grass for frogs; these two animals are therefore not very likely to come across one another; still, such a thing is possible, and does, we believe,

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occasionally happen—the rencontre taking place between an early hedgehog and a late snake.

The hedgehog is, *par excellence*, one of the scavengers of our fields; and although his staunchest supporters may not be able to clear him from the foul stain of occasionally indulging in a pheasant's egg, garbage and animal refuse form his general repast, seasoned with insects. It is very probable, too, that the hedgehog appropriates to himself the wounded game. After a day's covert shooting, many a wounded pheasant, hare, and rabbit, mortally struck, escapes from the dogs and the beaters, to retire into some quiet hiding-place to die; the hedgehog finds them out, and, if half dead, performs an act of mercy in putting them out of their misery; if he finds them quite dead, he is saved his trouble, and makes a good supper, devouring that which would shortly become putrid, and do harm to the remaining living inhabitants of the covert.

The baby hedgehogs are the funniest little things possible; they are born covered with tiny spines, which are quite soft, almost like hair. If touched, their natural instinct prompts them to curl up. This they cannot do, as the beautiful yet complicated set of muscles whereby they are enabled to perform this operation are not developed till the spines acquire some degree of hardness.

The bristle of the hedgehog, if cut across, will be found to be quite hollow; the walls are formed of a hard horny substance, and the interior is filled with a sort of pith—as pith lies in a stem of elder. It is, in fact, nothing more than a magnified human

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hair; and a human hair, under the microscope looks very much like a hedgehog's bristle when viewed with the naked eye. We know only of two uses to which the hedgehog's spiny coat is put by his enemy, man. Coachmen will sometimes tie a hedgehog's skin on to the pole of the carriage, to prevent a shirking horse from leaning against it, and we have seen the single spines used by the German professors of anatomy, to pin out dissections of nerves and muscles. These preparations are often placed in bottles containing a corrosive fluid; and were the pins used made of metal, they would shortly corrode, and spoil the preparation. In the hedgehog's bristles they have ingeniously found a natural pin, which serves the purpose admirably. I have often wondered they have never been made use of by English ladies. The North American squaws ornament baskets, moccasins, etc., with porcupines' bristles, and hedgehogs' bristles are not very unlike them.

I cannot conclude this article without mentioning, in short, a few hints given to me by a friend, who has so kindly supplied me with much of the matter I have embodied in the previous pages, relative to the science of gamekeeping, in which he is a great practical authority.

The unthinking, unobserving gamekeeper shoulders his gun, and walks round his coverts and woodlands, disturbing everything, and tires out his legs instead of using his brain; in fact, he defeats his own object, and gives himself much trouble into the bargain. To know if all is quiet in a covert, the observant sportsman should quietly

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steal into it, and station himself where he can have as extensive a view as possible. Having chosen his point, he should remain there as still as possible, with his eyes wide open and ears all attention. He should go early in the morning, or else in the evening, when the animals are all out at feed; and he should be particularly careful not to let them get scent of him. If he sees the game all out, quietly feeding,—the hares and rabbits unalarmed, the pheasants picking about at their ease, the wood-pigeons flying lazily to and fro among the trees,—he may conclude there is no enemy about, either vermin or poacher. A good telescope, or, what is better still, a good pair of double race or opera glasses, are exceedingly useful when on the lookout. The only drawback to their use is, that (as I have understood) statements of facts and deeds observed through a telescope will not be received by county magistrates as evidence. If the watcher sees no hares or rabbits, and no game out of the covert feeding, he may be quite sure that there is something about to disturb them; particularly if he sees (as he probably will) a startled hare or rabbit, fleeing from danger, come cantering along, stopping every now and then to listen, he may be certain there is something behind in pursuit, and should take his measures accordingly.

He should look at all footmarks, both of men and beast; and if he sees the print of a boot, he should know who has made that print, and whether the owner has any business going along there. He should watch the actions and countenances of the people labouring in the fields, and take mental notes

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at every gap in the hedgerow, every foot-stile in the path, and every gate in the roadway. In fact, the science of gamekeeping requires a good head, a sharp eye, an accurate observation of the commonest things, and a ready application of what has been observed. It is a talent that can never be acquired, unless it is *in the man* at starting. Observation, and accurate observation too, is the foundation of success.

I will give an instance. A gamekeeper is sound asleep in his bed. He suddenly wakes, and *fancies* he has heard a gun in the coverts; but, being still half-asleep, he is not sure, and even if he did hear the report distinctly, how is he to know in what part of the covert it was fired? In an instant, he should (without attempting to dress) rush to the house-door, and, opening it, look out sharply towards the moon, or, if there is no moon, towards that part of the sky where there is most light. The chances are that, in a minute or two, a frightened bird (most probably it will be a wood-pigeon) will pass between him and the light; he will note from what direction it is flying, and will start immediately in that direction to look for the poacher. The bird would not be flying in that course, if he had not been startled from his roosting-place by some intruder.

Observation, too, is most necessary for those who delight in fox-hunting; and people often get lost in strange countries for want of it. A master of fox-hounds—a specimen of the olden stamp, full of years, good health, and sound common sense—started one morning from his house to meet the

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hounds that had gone on to the covert some time previously. He was accompanied by a gentleman, in whom the power of observation was by no means developed. The squire soon struck off the main road, through a bridle-gate; then down a hedgerow; through a gap; then up a wet and muddy lane; then through a farm-yard; then from one corner of a ploughed field to the other corner, where there was no exit without jumping a ditch; and so on, through most out-of-the-way places, but yet always on a straight line.

At last his friend ventured to remark, "Are you sure you are right, squire?" "Right! Of course I am right," was the answer. And on they went again, straight across the country. Again the friend said, "It's very odd; I don't see any road at all. Where are we going?" "To the meet, to be sure," said the squire. "The hounds have gone along here." "The hounds gone along here! Why, how can you know that?" "*I can smell them,*" growled the squire, "quite plain; can't you? They have only been gone on an hour, and that's nothing." The visitor sniffed and sniffed, but could perceive nothing. "I don't suppose *you* could," remarked the squire; "it's only the master that can smell his own hounds: and you see I have been right all along, following my nose, for there they are by the covert's side."

In the evening, after dinner, the visitor was telling a long story of the wonderful power of the master's olfactory organs,—how that he followed the hounds to covert *by their smell*, and did not make a mistake the whole way. The story was

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passed round the table, and a discussion began among the younger hands; the old stagers held their peace, or narrated still more wonderful stories; till at last the squire let the "cat out of the bag," and explained that he had not smelt the hounds at all, but *only followed their footsteps in the mud*, from the highway where they turned off towards the meet by the covert side. Shouts of laughter ensued at the discomfited visitor, now that his wonderful story had exploded; and he packed up his bag next morning, thinking what a goose he had been not to have better trained his powers of observation of common things.

A HUNT ON THE SEA-SHORE

"A TELEGRAM for you, sir." Very well. "Wanted at Brighton immediately, to see an invalid." My portmanteau is soon packed, and as I roll over London Bridge, I think how soon I shall change the view of the muddy river for that of the open sea, and the rattle of cabs for the rattle of the pebbles on the beach.

The general complaint of a sea-side place is, that there is nothing to do; and we see ladies and gentlemen basking in the sun, and lounging on the piers, reading shilling novels and tales of love and murder, surrounded on every side by objects which, if they would only use their eyes, would afford endless amusement and instruction.

I lost no time, the morning of my arrival (business, of course, being first attended to), in getting down to the sea-side, and listening once more to

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the ocean's solemn and never-ceasing song of praise to the great Creator. To the observer, the composition of a sea-beach will tell much. From the Brighton beach we learn that the bottom of the sea, off the land whereon we now stand, is principally chalk; for it is composed almost entirely of flints of every possible form and shape, but all of them more or less rolled, and their edges worn off by the action of the water—for Nature never turns her work out square, always round; so that of the sea may be strictly said that which is said, in the Latin grammar, of a restless dabbler in bricks and mortar:—

“Diruit, ædificat, mutat quadrata rotundis.”¹

As the stonemason picks out the flints from the chalk-pit, pickaxe in hand, so does the sea, by the force of her waves, extract from their chalky bed the flints; but she does more than extract them—she, so to say, manufactures the raw material, and not only manufactures, but even sorts her work, when finished, ready for the use of man. Upon a careful examination of the pebbles on the beach, we find that they are sorted in a very regular gradation. When a wave runs in, it carries with it a certain number of stones, at the same time driving a certain quantity along the bottom. We find that the largest always go the farthest, the smallest stop first. Now, let us apply this. The portion of the beach nearest the shore is composed of the largest stones, ready sorted to the hand of the wall-maker; the intermediate sizes are farthest

¹ It destroys, it builds up, it changes *square things into round*.

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out, and are sifted by the mortar-maker to mix up with his lime. Farther out still, and under the water, are the smallest stones of all, namely, the sand. Of this the shrimper takes advantage; for, at low tide, he may be seen, up to his hips, pushing before him his shrimp-net, and disturbing the little denizens of the sand, the shrimps and prawns—condemned shortly to enter water at a considerably higher temperature than they have been accustomed to.

Among the shingle on the Brighton beach, I found many interesting things, which most people would call rubbish. They are of no use in themselves; but imagine the beach to become suddenly fossil, and how interesting would all these bits of rubbish then become, as proving the existence of a highly civilized people who once inhabited these shores. We find, mixed up with fish-bones, seaweed, etc., various kinds of the jetsam and flotsam of the ocean. Rolled bits of ginger-beer bottles, made of clay; of wine bottles, tobacco-pipes, etc., made of glass, proving the luxury of these ancient people; of old shoes, of knives, of hard slag (whence we might infer the existence of gas-works), of combs, hair-brushes, etc.; and, what is rather curious, I found a ball, as large as a good-sized turnip, and quite as round, composed entirely of human hair. The only way I can explain the formation of this ball is, that the hair taken from the combs of the inhabitants of Brighton is thrown away, floats down the drains into the sea, and there becomes regularly felted and matted together by the waves perpetually rolling it up and down on the hard shingle. I at

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first wondered how the harder and heavier articles of human manufacture, such as bottles, etc., became spread in such abundance along the shore, for they would not float down the drains, like the hair. The problem was solved when I discovered that the rubbish carts of the town shot their loads over the cliff at the extreme east end of Brighton; the authorities hoping thereby to prevent the cliff falling further than it has fallen already. This then is, I believe, the main source of most of the water-worn human manufactures found spread out, for some three or four miles, to the eastward of the town.

The sea at Brighton not only rolls in flints from the chalk, and sundries from the rubbish-hole, it also washes up lumps of chalk, from the size of a small apple to that of a child's head. These lumps will be found, for the most part, bored through and through with holes, as if an industrious cheesemonger had been working away at them with his cheese-taster. If the inside of these holes be examined, it will be seen marked all over with minute scratches or indentations; it is, as a friend has aptly expressed, "rifled in the barrel." These perforations and riflings are not, however, the work of man, but of a delicate little shell-fish, called a *Pholas*. We showed one of these to a fisherman, wishing to get the local name. "Them things, sir? Why, them things be *pitticks*; but I don't expect that's the right name for 'em." There is a large flat surface of chalk to be seen at low tide, to the east of Brighton, perfectly riddled with holes made by these creatures. If an empty

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pittick's hole be examined, it will be found covered with markings, as though some instrument or some acid had been at work. Now, this is the very point which has set those interested in the subject at loggerheads; but, while they are arguing and disputing, the Pholas quietly goes on working away, making a comfortable hole for himself. On the whole, however, the jury seem inclined to bring the Pholas in guilty of mechanical, not chemical violence, inasmuch as there is no acid found, or other solvent known, that will act equally well upon wood, limestone, hard and soft clays, sandstone, and even, in one case, upon wax; it is also highly improbable that the animal can secrete a solvent for each and every substance in which he may feel desirous to hide his head.

If the reader will examine the outside of a Pholas shell, he will find it studded, in regular rows, with little projections, which are copied *exactly* on the rough surface of a farrier's file; he will also see models of them on the inside of the common nut-crackers. It is, therefore, most probable that, when the shell wishes to embed itself, it fixes itself firmly by its foot—which acts like the leather sucker used to lift stones by school-boys—and then, by working itself from side to side, presenting the edges of its shell to the substance to be bored, it gradually cuts away a cavity for itself somewhat in the same way as the instrument used by artesian well-makers cuts through the soft clay. Now, what becomes of the dust, or rather mud, which must naturally result from the boring of the shell? Unless he had some apparatus to eject it, it would

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soon accumulate in the hole, and considerably inconvenience the operator; accordingly, we find that he has a very pretty contrivance for ejecting the same. If the reader happens to be in a neighbourhood where the Pholas is left dry by the retiring tide, he will have an opportunity of judging for himself; for, as the shells perceive his footstep, they will eject, to a considerable distance, a spout of water, which is generally clear, but which, if they have been at work lately, will be coloured with mud, the result of their borings.

I must now, with the reader's permission, change the scene of the "Hunt on the Sea-shore" to that charming sea-side town, Folkestone, where I had the good fortune to be able to spend three weeks (note-book in hand) during the autumn of 1859.

Folkestone, anciently called "Fulchestan" and "Folkston," was of considerable note even so long ago as the times of the Romans. As we have a "King's-stone" near London, so we have a "Lapis Populi," or people's (folks) stone in Kent; and from this we may conclude that, when the invading Romans came over to this island, they found numerous inhabitants at this town. It is believed to have been the site of one of their numerous fortresses, which they wisely erected to guard themselves against the bugbears of those days—the Saxons. Just as *we*, the present occupants of this island, have a military station at Shorncliffe, for defensive purposes, on the heights above Folkestone, so did the Romans form a camp and look-out upon the top of Castle Hill, about a mile and a half behind the town, and just above our

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present encampment. There is about as much trace left of the Roman camp now as there will be of Shorncliffe a thousand years hence, viz. a few earthworks covered over with nature's carpet, green grass and turf. But if the works of man are perishable, the works of nature are not.

The action of the waves upon hard stone near this town, as well as upon chalk at Brighton, can be well observed; for, in order to preserve the town from the white-crested battering-rams of Father Neptune, two sea-walls, called "The Horn," have been constructed, on each side of the entrance to the harbour, with stones collected from the neighbouring cliff. This cliff is composed of sandstone, disposed in layers, which crack off in places from each other like the sheets of an unbound book. There can be no doubt that this sandstone, now as hard as sheet iron, once formed an ancient sea-beach, and that, long before the creation of man, the waves rolled in, and the tides ebbcd and flowed upon this now fossil sand, exactly as they do at the present moment. Examine it, and you will find well-marked holes and borings of the "lugs," or sea-worms, the descendants of which are this day alive in hundreds in the mud of the harbour not three yards off. When the lug makes his boring, he lines it with a sort of cement, and thus leaves a regular open tunnel; the next tide fills up these holes with sand and mud, and we find these turned into fossil, resembling holes made with a common walking-stick. These ancient lugs were evidently gigantic fellows, if we judge by the holes they made. They themselves have disappeared,

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but their holes remain, converted by the magic hand of Time into adamantine rock.

We observe in this formation a good example of the tendency of sandstone to assume rude crystalline forms, for it often presents blocks the edges of which are rounded and smoothed with almost mathematical accuracy; and this explains how a large stone as round as a cannon-ball, and exceedingly like one in appearance, was obtained by the coastguard man at Sandgate (a village close by) to form the summit of his garden gate-post. At first, I thought it was some ancient stone cannon-ball of gigantic dimensions; but, no, it was never manufactured by the hand of man, but by the ocean, whose delight it seems to be to transform everything submitted to the action of her workmen—the waves—into a rounded form. Who ever picked up a stone on the sea-shore, that had been long submitted to the action of the waves, that presented any edges or square corners? The ocean has put these blocks of semi-crystallized sandstone into her water lathes and converted them into cannon-balls. It would be entering into a difficult geological question as to *when* this sandstone formed the actual sea-beach. Suffice it to say, that it was long anterior to even the creation of man, that it had nothing to do with the deluge, and that there is no doubt that a gradual upheaval of the land has taken place at some very remote period, raising up the chalk downs, and the various strata near it.

In the hard stone blocks which compose the walls of the “Horn” are thousands of the holes of the

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Pholas, made at the time that these stones were lying in the sea, at the base of the neighbouring cliff; and when the Pholades die, and their shells drop out, numerous sea creatures use their holes for habitation. Little crabs, shrimps, sand-hoppers or (as the men call them here) skip-jacks, together with thousands of little animals exactly like common woodlice, which the amphibious boys about the pier called "monkey-peas" (and not a bad name either—monkey, because of their activity; peas, because they roll up, and look like peas), are seen swarming in every direction. These little "monkey-peas" are vegetable feeders, and they will get into the boats and devour the planks forming their sides, if not well looked after. They also eat up the sails and nets, if left rolled up any time. Then, again, the whole surface of the rocks is coated with hard white peppercorns. These are thousands of acorn shells, or barnacle shells—stupid and uninteresting things when left high and dry, but beautiful when seen feeding in a vivarium.

But have all these little beasts no enemies? The long swell of the tide brings them in in legions: first of all come sailing along the jelly-fish, curious things, that look like a flexible soup-plate of calves'-foot jelly. They are of a bell shape, and swim along by means of contracting and expanding their bodies, like the opening and shutting of an umbrella. They have numerous queer names. The Folkestone name for them is "slutters"; at Dover they call them "water-galls," and "miller's eyes" and "sea starch"; at Portsmouth they are called "blubbers"; elsewhere "slobs" and "slobbers."

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They are great bores to the fishermen, who often catch so many in their trawl-nets that they can hardly haul them on their boats. When the nets are brought up, they appear to have been soaked in a strong solution of common starch, and require boiling before they are fit for use again. There is also a species of jelly-fish that has long strings like wire tendrils hanging down from them, which have the power of stinging : these are called " sea nettles " and " stingers." These latter kind are not common in shore ; their home seems to be out at sea, where they are caught of an enormous size. Hard weather drives them in, and then let the bathers beware. I know a young lady who was severely injured by one of them : being ignorant of its powers, she foolishly caught it as it floated by, put it to her mouth, and bit it ; she suffered acute pain and swelling of the lips and face for several days, in consequence of the sting she received from the brute. The sensation of the sting is like a sharp blow with a bunch of common stinging-nettles ; it causes a sense of irritation and itching all over the body.

On the 25th of August, when out fishing, I observed innumerable specimens of a very large kind of jelly-fish, which the fishermen call " blue slutters." They were about the size of a very large cabbage, and presented round the margins of their cup-shaped bodies an edging of a most beautiful blue colour. I dissected several on the spot, but was soon obliged to desist ; for the left hand, in which I held them, became covered with a red rash, and the fingers felt numb and as though

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seized with an attack of "pins and needles." It is, doubtless, this power of stinging that enables the slutters to procure food. The fishermen declared that they subsist on the water, but I found out they ate something more substantial. I never examined a specimen without finding in one of four cavities which form the stomachs several skip-jacks, some alive, some half digested. Sometimes I have found these little brutes so recently made prisoners, that Mr. Jack has made a skip out of the jailor's stomach, and was free again in the sea.

I now understand why they are called "miller's eyes." When the stomach is full of food, they present the appearance of having four great goggle-eyes staring through a pair of spectacles. I know not what creatures eat these "slutters" when alive, but I found one dead, around which were a whole shoal of hungry shrimps, eating away as hard as they could. When the "slutter" is dried, it shrivels away to nothing, there being so much water in its composition. They are on this account useless to the farmer as manure. In the Chinese seas they are found of gigantic dimensions; and a gentleman informs me that, when off Macao, in China, he saw the fishermen collecting them by boatloads. They did not touch them with their hands, but caught them with large iron rakes. These Chinese (probably aware that they would dry up if exposed to the sun) wisely mixed them up in other manure, which was afterwards dug into the ricefields.

The base of the Fólkestone pier is covered with numerous plants, that are commonly called "sea-

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weeds." I do not think they ought to be called "weeds," because, according to Johnson, a weed is "a noxious or useless herb;" let us rather call them "sea-plants," for they are quite as useful in the economy of the world of water as the green vegetation is in the well-being of the world of land. When the tide is down, these plants hang about, dirty and black-looking objects. When the water comes in, they assume another aspect, and float about with graceful wave-like motions. Why are they not knocked to pieces by the restless waves?

Take one example, the common "bladder-wrack;" we find every here and there, regular bladders in its substance, each containing air, and these act the part of buoys, lifting up the whole plant, and preventing injury being done by the crushing and bruising action of the rolling swell. If we make a section of these bladders we shall find inside a beautiful network of silk cobweb-like fibres, which form a pretty pattern with their complicated interlacings. When these plants have been submitted any time to the action of the sun, the air inside the bladders becomes expanded, and they make a famous popping noise when trodden upon. Nature seems frequently to apply modifications of one and the same plan to different purposes, and man follows her example; thus, we have a bubble of air enclosed in an iron case, forming a floating "buoy," to mark out dangerous sands, etc., to sailors, and we have a lighter kind of air, commonly called "gas," enclosed in a silk case, which will float in a different medium from water, in the form of a balloon. If we were given a yard of rope, the end of which

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was untwisted for a couple of inches, and were told to fasten the unstranded portion on to a rock in such a manner that the waves would not move it from its place, we should attempt our task in vain; but yet in the roots of humble and despised sea-plants, which have taken their growth on bare and smooth stones, we find a wonderful example of a fastening more adhesive than any human sewing or screwing—more difficult to be moved than if it were attached by marine glue of a hundred horse power.

Among the thickets of the submarine underwood live the enemies of the crabs, the shrimps and the barnacle shells. I caught many whiting pouts, or "pouters," as they are called at Folkestone, and found, without exception, that there was a red-brick dust-like substance upon the lower surface of their bodies; this felt gritty to the fingers, and I suspected it was the powdered shells of crabs. My idea was soon substantiated by my finding in the stomach of a "pouter" two or three crabs more or less digested, and their hard shells powdered by the action of the digestive process. At low tide the crabs get into the holes of the rocks, and come out again as the water rises, just in time to meet the hungry pouters, who come in with the tide to look for their dinner in the harbour.

Upon my hook, close to the pier, I caught a little black fish with a malignant, diabolical countenance. I was going to unhook him, when a boy cried out, "Don't touch him, sir; he is a 'bull-rout,' and he will bite you." I shook him off the hook, and found the boy's advice to be founded on experience,

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for Mr. Bull-rout fastened on to a bit of wood, and bit it severely. The bull-rout is the "goby" of Yarrell. His mouth will well repay examination; a more formidable and desperado-like set of teeth I never saw. They are more like a tiger's than a fish's teeth; but how beautifully are they adapted to their work! All the "bull-routs" I caught had their stomachs full of the barnacle shell, and their office seems to be expressly to feed on the barnacle. Every one knows how tightly this little shell fastens itself to the rocks, and the bull-rout's teeth seem to have been made expressly to tear it off.

The action of the breaking waves and rolling shingle often produces curious results upon wood submitted to their action. Long jetties of deal wood are run out from the shore at Folkestone, to enable the shingle to accumulate for the protection of the harbour; fastened upon these deal piles I observed a substance that looked like an extraneous growth. It was nothing but the softer parts of the wood hammered by the waves and shingle into a sort of pulp, which had afterwards got dry. It was arranged somewhat like the curls of the hair of an African negro, and in a pretty chequered pattern. I was much pleased to find exactly the same appearance on the board, also of deal, belonging to one of our soldiers' wives whose sick child I was attending. The perpetual friction of wet clothes, soap, etc., will therefore produce the same result upon a soft deal board (only in a minor degree), as do the waves of the sea upon the deal piles of the breakwater. •

Cast up by the waves, and lying among the

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seaweed at the foot of the pier, I espied a black mass of something that looked like a bunch of burnt vial corks tied together. I asked a prawn-fisher what they were. "Sca-grapes," said he. I pretended not to understand. "Well, sir, if they ain't sea-grapes they are tortoises' spawn." "And what are tortoises?" "Tortoises is ink-spewers, and ink-spewers is scuttle fish." Here, then, is the fisherman's account of the eggs of the common cuttle- (not scuttle) fish. These eggs are very like a bunch of black Hamburg grapes, each conical-shaped egg being composed of a thick, hard material, and bound by a foot-stalk on to a centre string, which is as thick as a lead pencil, and feels like india-rubber when cut with a knife. As the specimen was recently thrown up, I thought that possibly the young cuttle might be alive. I opened one of the largest eggs, and there I was pleased to find a little cuttle, the size of a split horsebean, all alive oh! It was perfect in shape as its parent, but soft in substance as a bit of fresh paste made of flour. I put him in a quiet pool of seawater, and in an instant the water became black, as though a thimbleful of writing-ink had been upset into it. The cuttle is a favourite food of many sea animals, and he has no defence but concealment. When he sees his enemy coming he has the power of emitting from his body a quantity of ink-like fluid, which obscures the water and hides his shining body. This ink, when collected and prepared, is known as sepia, and is, as everybody knows, much used for drawing and other purposes. It was most interesting to see that this little cuttle-

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fish, which was only about half-way through his egg-state of existence, used his natural defence the very instant he first saw sunlight, and some days, maybe weeks, before his proper and natural time of appearance.

The kind of cuttle-fish whose eggs I found has a curious-shaped white bone in the centre of its soft body, and we frequently see large bottles in chemists' shops full of these cuttle-fish bones. They are used when finely powdered for tooth powder, and also to rub out ink-marks from paper; their gritty consistency makes them useful for these purposes, and whereas they are composed principally of lime, they are often cut into bits, and given to canary birds to peck at. Their beautiful laminated internal structure will well repay examination. Besides this common cuttle-fish, there is another kind of creature very like it found in the sea near Folkestone. These have no bone in their bodies; the fishermen call them squibs (read squids) and *Man-Suckers*, because they have powerful sucking discs on their long arms, with which they can take a very firm hold on intruding hands. They are not commonly found near the shore, but live more out at sea. I was lucky enough to find one of them exposed for exhibition on a fish stall. His length was about two feet when spread out; the body of the shape and the size of a large Jersey pear; the head in its outline much resembled that of an elephant when viewed from the front, surrounded by eight long arms, the lower surface of which were covered with pumerous sucking discs, and upon turning these away, the mouth was

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exposed, formed by two hard, black, horny beaks, exactly like the beak of a parrot, and this is well calculated to inflict a severe bite upon the unfortunate fish or crab that is held fast to it by the powerful suckers. These beaks are found fossil, and in early times of geology were a great puzzle to beginners, and there were many disputes as to what they were. The eye is very beautiful; it is oblong, like the eye of a Chinese, and the pupil is of a bright and resplendent gold colour. The lens is highly complicated, and shaped like a magnifying lens. Its Latin name is "Octopus."

The power of vision must be acute, for, shortly afterwards, when fishing with a line about two miles out at sea, I espied a "man-sucker" of a large size, floating quietly by the boat. I was preparing to plunge in to catch him, or he to catch me with his suckers, but he saw me, and sank down out of sight like a ten-pound shot. He was floating with his beak upwards, and his arms hanging downwards like the plume on a soldier's helmet, the boss of the helmet representing the mouth. Determined not to be disappointed, I offered a reward, and have obtained a living specimen of a "man-sucker." There is a certain poor old man, who gets his living here by catching crabs in crab-pots among the rocks; he told me that a day or two ago, near the harbour, a "man-sucker" got into one of his stalkers, and ate up two of his lobsters, worth a shilling. He "heaved" him overboard, because "he ain't no use." I explained that he was of use, and the poaching "man-sucker" is now sprawling his long arms before me. The old man once tried

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the experiment of keeping one alive in the bottom of his boat when in harbour, "to frighten away the boys" from playing with the boat; but he found it had the contrary effect.

The colour of the specimen when first caught was that of brown silk, a pleasing colour to the eye, shot with gold; but the tints gradually got dull as the animal became exhausted. Underneath the skin of the body and the arms is seen waving about, as if from cell to cell, a dark brown-coloured fluid, causing the tints of the skin to become at times almost white, at other times almost iridescent. I do not know that this fact has ever been noticed before. I find that strong brine has caused my pet "man-sucker" (who soon died) to turn of a red colour, like the outside of a bit of boiled beef. The conical eyes are defended with eyelids, which the animal closes when the eye is touched. The natural position when at rest is with the mouth turned downwards, and the suckers applied to the bottom of the vessel; they hold so tight that the creature can be removed with difficulty; the moment one arm relaxes, the others hold firmer still. I allowed him to grasp my hand and arm—the feeling is that of a hundred tiny air-pumps applied all at once, and little round red marks are left on the skin where the suckers were applied; and when they were all fast, the animal could hardly be got off again. The sensation of being held by a "man-sucker" is anything but agreeable. The feeling of being held fast by a (literally) cold-blooded, soulless, pitiless, and voracious sea-monster almost makes one's blood run cold. I

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can now easily understand why they are called "man-suckers," and why the natives of the Chinese and Indian seas have such a horror of them, for in these climates they are seen large and formidable enough to be dangerous to any human beings who may be so unfortunate as to be clutched by them.

It is not impossible that the extraordinary sea-monster, the "Kraken," may have been some kind of gigantic cuttle-fish. Mr. Pennant thus writes of the eight-armed cuttle-fish: "In the Indian seas this species has been found of such a size as to measure twelve feet in breadth across the central part, while each arm was fifty-four feet in length; thus making it extend from point to point one hundred and twenty feet." He further states, that "the natives of the Indian Isles, when sailing in their canoes, always take care to be provided with hatchets, in order immediately to cut off the arms of such of these animals as happen to fling them over the sides of the canoe, lest they should pull it under water, and sink it."

The opinion of Dr. Shaw is equally decided regarding the occurrence of this animal: "The existence of some enormously large species of the cuttle-fish tribe in the northern Indian seas can hardly be doubted; and though some accounts may have been much exaggerated, yet there is sufficient cause for believing that such species may very far surpass all that are generally observed about the coasts of European seas. A northern navigator, of the name of Deris, is said, some years ago, to have lost three men in the

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African seas by a monster of the colossal cuttle-fish kind, which unexpectedly made its appearance while the men were employed, during a calm, in raking the sides of the vessel. The colossal fish seized three men in its arms, and drew them under water, in spite of every effort to preserve them: the thickness of one of the arms, which was cut off in the contest, was that of the mizen-mast, and the suckers of the size of pot-lids."

Most of the fishermen's houses in Folkestone harbour are adorned with festoons of fish hung out to dry; some of these look like gigantic whiting. There was no head, tail, or fins to them, and I could not make out their nature without close examination. The rough skin on their reverse side told me at once that they were a species of dog-fish. I asked what they were? "Folkestone beef," was the reply. What sort of fish is this? "That's a Rig;" and this? "that's a Huss;" and this other? "that! a 'Bull Huss;'" this bit of fin? "that's a 'Fiddler;'" and this bone? "that's the jaw 'of Uncle Owl,'" etc., etc.

Here, then, was a new nomenclature; but I determined to clear up the matter, so, day after day, when waiting in the harbour for the trawl-boats to arrive, I took down my two volumes of *Yarrell's British Fishes*. A class was soon assembled, and turning over the pages one by one, I asked the name of the fish whose portraits formed headings to the chapters. In this way I got a curious collection of local names. I give now only the dog-fish kind. A "rig" is the "common tope"; a "bastard rig" is the "smooth hound";

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the "huss, or robin huss," is the small spotted dog-fish; the "bull huss," the large spotted dog-fish; the "fiddler," is the angel, or shark ray; "uncle owl's jaw" belonged to a species of skate.

Nearly all these various kinds of dog-fish above mentioned are caught by the men who "go out after rigs" to the "hungry ground," over the Warne sands; and they catch them with "long lines," laid down all night.

Some of the large rigs are nothing more nor less than sharks of the English waters, and most formidable creatures they are. They have teeth of a triangular shape, exceedingly sharp, and so arranged that if one is broken off another comes up into its place. "You see, sir, they has jaws as tears ye like a bramble-bush." The skin is not covered with scales, but with an exceedingly tough armour, which sets the teeth on edge when felt, and is "a terrible thing to dull your knife." When the rigs, etc. are caught out at sea they are thrown down to the bottom of the boat, and as they jump about there they can be heard "grating one against the other." A rig lives longer than any fish in warm weather, but dies soonest in cold. When the lines are hauled, and there are a lot of freshly-caught savage rigs at the bottom of the boat, the men are obliged to be careful not to get bitten. "They all goes mad, sir, and it's like being among a lot of wild beasts." They have been known to catch hold of the men's "barbel," or fishing petticoat, and shake it. I have seen a small boat nearly full of these various kinds of fish—rigs, husses, bull-

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husses, fiddlers, etc. They are vagabond curs of the ocean, that go prowling and snapping about anywhere and anyhow for food. The fishermen hate them because they do so much damage to the herring-nets, eating the fish actually out of the net, and often rolling themselves right up in it.

At Dover, during the herring time, there are plenty of "rough dogs" and "smooth dogs," and the sea sometimes boils with them. There is a very peculiar smell about these dogfish, and they are not good to eat boiled or fried. Ten minutes after the arrival of the boats the small fish-dealers may be seen cutting off their heads, tails and fins, and splitting them into halves; they are then salted and hung out to dry, and taste, when boiled, "like veal chops." They are eaten by the poorer class, "as a relish for breakfast." The great heads, and the intestines, etc., are left in the harbour till picked up by the owners of crab-pots or stalkers for baits. The livers are colled and boiled for oil for the boats in winter. There is an immense deal of gelatine in these heads and fins, and I tried in vain to persuade the men to boil them up, quoting the example of the Chinese, who esteem shark's-fin soup as a great delicacy. An Englishman is naturally a bad cook, and soup-making of any kind is not his forte.

A wandering showman came into the town, and, for the sum of one penny, I saw "the largest alligator ever imported into this country taken alive;" the thing had been stuffed the last twenty years. It had been captured on the banks of the

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Nile, to the great joy of the inhabitants, whose cattle and children it had frequently devoured, and its natural teeth had been replaced with pegs of wood and tips of cows' horns; and it was indeed "a monster." I saw also in the show "the angel-fish;" the body, and shoulders, and neck are like a girl of fourteen; the feet and legs are like a large goose; the rest of the body like a fish: it was "caught in Africa." This wonderful thing was only a large "fiddler," tortured into something like a human shape.

One day at Folkestone, when it was blowing hard, I saw the same old man mentioned before, looking out towards the sea with the most dismal countenance. "What is the matter?" said I. "Lord, sir, it's hard times; I have not caught a 'pung' or a 'heaver' in my 'stalkers' this week; the 'man-suckers' and 'slutters' gets into them, and the congers knocks them all to pieces." My friend was a hearty old man, over eighty, and gained his living by sinking among the rocks his "stalkers," *i. e.* crab-pots, made of hoops and nets, in order to catch "pungs" or "heavers," that is, crabs. The "man-suckers" and "slutters" which annoyed him are cuttle-fish and jelly-fish. The poor old fellow gets a scanty living by paddling about all day in his boat in fine weather; but I fear he will one day lose his life in his occupation, for he has twice been found watching his stalkers, helpless and half frozen, and has been towed into Folkestone harbour by the trawl-boats.

As his "stalkers" are always down, he has bad

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sport, because "the rocks is all catched up"—*anglicè*, he has caught all the crabs that are about. The great event in his life was the capture of a crab, for which he got two shillings at the "Flower-de-luce," *i. e.* Fleur-de-lis public-house. He is contented now if he gets a dozen little crabs the size of coachmen's buttons, worth a halfpenny each. His costume, and solemn, wrinkled, but handsome face, were so remarkable, that I persuaded him to sit for a photograph with his old hat on. This is a wonderful hat—at least fifty years old, and without a particle of nap on it. It forms his storehouse, in which I found that he kept hooks, lines, tow, needles, knives, bread and cheese, and, last but not least, a stout bit of knotted rope coiled up at the bottom, with which he "jackets" the boys when he finds them playing with his boat. He is full of stories of the good old smuggling times, of wrecks, and of local fishing and seafaring events, which but few men in the harbour but himself can recollect. I had many a long chat with him when he was in a good humour.

There are several kinds of crabs which he catches, viz. the "Spanish crab," a green fellow "which has oars to swim with" (the edible crab can't swim), the "spider crab," and the "adder crab," a little fellow, capital bait for "hooking" or fishing, in deep water from a boat, for whiting and "pouters," or whiting pouts; he "heaves them all overboard," except the "pungs" or edible crabs. The "pungs" alone I have observed simulate death when brought out of the water, the other

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kinds run about the bottom of the boat right merrily. "A good pung 'heaves' (*i. e.* bulges out) at the tail, and is thin in the shell, showing he is full of fish and not water." He can be killed by a stab under the tail. This operation is generally advisable, because Mr. Pung, "pinches on the sly without mercy, and holds on like a bull-dog;"

With stony gloves his hands are firmly cased ;

and when he has once got hold, the only way to get him off is to snap off his claw from the body. The green crab "nips ye sharp and lets go again."

A fisherman in the harbour was holding up a large pung for sale, when he was caught by one of the claws, and in trying to get it off the other claw got hold also, and made him a prisoner by both hands, to the delight of the amphibious boys who abound in this locality. Finger-nails are often destroyed by the pungs, being pinched off as though in a door.

Crabs are terrible fighters, and often lose their claws, which sometimes grow again. I got one specimen without any claws at all, and no appearance of their coming again, for the wounds were covered with barnacle-shells. The explanation of this phenomenon was that "he throw'd his claws when he was young, and they never grow'd again." My father's old friend, Mr. Stowe, of Buckingham, tells me that when at Carnarvon, he saw several women sitting at stalls selling bundles of crabs' claws for a penny. On asking where the crabs

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were, they said, "We puts them back again into the water, and they grows again." Lobsters are terrible fellows "to shoot their claws," which detracts much from their value, and when alive and freshly caught the fishermen won't allow them to be handled for this reason. When first taken, they are "awful savage, and flies at ye like a dog."

It is curious to remark the difference in structure of the lungs of the fish, and the lobster and crab. They both live in the water, but yet, if taken out of the water, the fish dies at once, the lobster will live some hours.

May not the explanation of the structure of the lung which breathes as well in water as in the air be as follows?—The fish are supposed always to live in the water: those which live in deep water never run the chance of being left high and dry; those which live along shore, as the fisherman well knows, run in and out with the tide, as their instinct prompts them to do, in order to avoid this catastrophe. If by chance these fish are left by the receding tide, they soon die; crabs, lobsters and cuttle-fish, on the contrary, live among the rocks; *they* can't run in and out with the tide, and they therefore often get left high and dry on the rocks, or on a fishmonger's slab, which is the same thing in effect. Nature, in her wonderful wisdom, anticipates all this (not the fishmonger's shop), and gives them a breathing apparatus, by which they are enabled to keep alive till the tide comes up again and covers the rocks, enabling them to refill their breathing sacks. A lobster, I believe, if left

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on the rocks, never goes back into the water of his own accord; he waits till it comes to him. I say this, because when the landslip took place near Lyme-Regis, in Dorsetshire, a great portion of the bottom of the sea was forced up by the weight of the landslip on the margin of the shore. On this suddenly elevated bit of ground there happened to be several lobsters, who, doubtless, thought the low tide had taken place, with uncommon celerity, and that it would return again. Anyhow the brutes, obedient to their instinct (I dare not call them stupid), waited for the tide to come up and cover them. Of course it never did come up again; they remained in their places and died there, although the water was in many instances only a few feet from their noses, and they had not the sense to tumble into it and save their lives.

The crab's broad back affords a capital habitation for minor sea creatures. Sailors have observed the fact of shells sticking to crabs and other animals which live in the sea. Hence, an old patriarch sailor who has long been at sea often goes by the nickname of "Old Shellback." I have got a crab with a regular crop of young oysters on his back, and another whose shell had been pierced by some boring animal; in order to mend the hole, the crab had secreted a round nob of shell *on the inside*, and this looked very like a pearl. In the Museum of the Royal College of Surgeons is a very remarkable specimen, showing the same process of healing a wound of the shell in the true tortoise-shell turtle. The creature had been wounded in the back,

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probably by a spear such as is used to catch them when floating on the water; it had escaped with a hole in its shell, which nature had beautifully mended with a round nob of true pure tortoise-shell. This nob is about the size of a cricket-ball, and like the cricket-ball presents a series of laminæ on a section being made. It is a unique and most curious example of Nature's mode of healing under difficulties.

I was told of a great curiosity, a most wonderful new bait to put into the lobster-pots; I found it out, and ascertained it to be a common phial physic bottle, silvered in the inside like a looking-glass. It was given by a gentleman to Smith, sen., one of the patriarch fishermen in the harbour, who showed it to me. His theory was, that "the lobsters come to see themselves in the glass;" but I doubt whether a lobster (even though he has "a lady in his head") has vanity enough to use a looking-glass. It must be the glistening of this bright object that attracts them, because, when bait is scarce, a "bunch of oyster-shells with the dark part scraped away" will sometimes catch them; "but they gets out again pretty quick if they don't find nothing to eat." There are plenty of fine prawns about the rocks, and there are two modes of fishing for them; first, with a common shrimping-net pushed along the sand; and, second, the "lock-nets," which are simply a large form of the round nets used to catch freshwater crawfish. A bunch of fish (with the dark skins taken off) is tied on to "the bridle," a string that goes across

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its centre, and a long line with corks attached; the corks are covered with white linen, that they may be seen in the dark. The "prawner" has a stick some seven feet long, with notches at the top; as the tide goes down he puts his net among the rocks, and leaving it a few minutes hauls it up on the stick with a jerk, as the prawn is an active fellow and soon jumps out. The best bait for prawns is "a fresh sheep's head." It is no use fishing for prawns till the sun is down, and then, and not till then, the prawns begin to feed. It is a curious fact that the prawns are most numerous "just as the visitors go away;" but the season has, in my opinion, more to do with this than the visitors.

The crabs—the spiders, the Spanish, the soldiers, and the adders—are a great nuisance in the lock-net fishing; they get to the bait and are hauled up by the score, pinching the poor man's fingers terribly when he tries to get the prawns out from among them; for it must be recollected that it is pitch dark, and the contents of the net not easily seen. The prawns themselves make wounds on the fingers with their sharp and projecting "spears." The hands of one of the prawn boys was just as if it had been "crimped" all over from this cause. It is dangerous work fishing in pitchy darkness among the slippery rocks, "where you may knock yourself all to pieces in a minute," the tide rolling in fast all the time; and the following was the anathema of my companion, a poor man who had been hauling up red crabs, and not prawns, from nine to eleven that night: "Dash them crabs, the rascals, they

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hinder me of many a shilling and rob my young ones of many a slice of bread and butter; them fellows won't let ye have a prawn if there is one in the net. I will smash some of ye, anyhow," said he, as he dashed crab after crab on the rocks. However, I consoled him somewhat by buying a large bag full of his crabs, and served them out by boiling them for supper, but they were very bad eating.

Both lobsters, crabs and prawns cast their armour when they get too big for the one they occupy. When a lobster is being eaten at table, a skin will be found under the shell, and it is this skin which will harden into a shell when the old one is cast off. I was lucky enough to obtain from a shrimping boy a lobster who had just cast his coat. The new one was soft to the touch, and like moistened parchment. It is a rarity to catch these "soft lobsters," as the creature knows that before his armour gets hard he has no mode of defence, and hides himself away in a snug corner; but my friend did not calculate upon the shrimping boys, who espied him under a rock at low spring tide, and made an easy capture of him.

As the steamer from Folkestone paddles along towards Boulogne, she crosses over two sandbanks that lie about mid-channel. These are doubtless two subaqueous chalk hills, the summits of which have been covered with sand by the action of the tides; between these hills deep water (*i. e.* a valley) is found. These banks are called by the fishermen the "Warne," or "Werne," and the "Ridge."

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Congers, dogfish, bass, etc. form the game in these submarine preserves, and to catch them the fisherman "shoots" not his gun, but his "long line." Besides the Warne and the Ridge there is another naturally formed longer preserve "off the Ness," *i. e.* "Dungeness Head," about eleven miles by sea S.E. of Folkestone. Extending several miles from Dungeness towards Hythe there is a long dreary beach, composed entirely of loose shingle. It is exceedingly difficult to walk for any long time on this shingle; it is just loose enough to admit the foot and ankle at every step, and in a few minutes the pedestrian becomes exhausted, and can hardly proceed on his way, or, in fisherman's language, "the stones would pull your legs out of the sockets of your body." Business compels these poor fellows to walk on the shingle, and necessity being the mother of invention, they have contrived a species of shoe or patten, on the principle of the Esquimaux shoe, or the mud-shoes of the wild-duck shooter. They consist of light boards, about the length of an Esquimaux shoe, upon which is a strap to insert the foot. On these they are enabled to traverse the shingle without sinking in. The local name for these ingenious contrivances is "Bexters;" the derivation of this word is a mystery to me, unless a man of this name invented them—thus becoming immortalized, as the memory of our great surgeon, Abernethy, is daily called to mind when we ask for sixpennyworth of Abernethy biscuits.

The water just at the Ness is exceedingly deep;

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even close up to the cliff there is from twenty to thirty fathom water. Down among the rocks at the bottom of this hole or natural pond the "great" congers hold nightly revels. Their mid-channel brethren are not nearly so large. The first sight I got of the congers at Folkestone was in a "lug sail-boat," which ran in at high tide in company with a fleet of trawl-boats, laden with congers, or rather marine boa-constrictors. When the boat stranded, the men threw them out on the shore one by one, and there they lay, just able to wriggle, and to gasp with their formidable mouths. Some of them were of a pale white colour, but the majority were sprinkled here and there with nut-brown markings, making them look much more snake-like than when hung up in Billingsgate. The crowd gathered round. "Who will buy this parcel of congers?" said the fisherman, picking up a stone, and standing with the congers all placed before him. The biddings went on fast. £1 5s. was bid for the lot, in number twenty-one, large and small; down went the stone, and the purchaser hastily pitched the great brutes into "kittens," as they call the fish-baskets, and in twenty minutes the congers passed me in the open luggage-van of the train on their road to London.

These were "Ness congers," and are caught on a "long line." The lines laid for them are seventy-five fathoms long, and on each line are attached at right angles other smaller lines, viz. the "snoods" twenty-three snoods to each line, each snood nine feet long. The hooks are nearly as large as the

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hook of a roasting-jack; they are made of exceedingly tough wire, that will bend to any amount, *but never break*. Strange to say, these hooks can't be bought in England; they are all of French make, and cost about 2s. 6d. a hundred. Each hook is fastened by a simple but very firm knot to the "snood," by means of a tough bit of cord called the "beckett"—a wise provision, for the congers "saw themselves on the rocks, and often burst the line;" and when they are first hauled up there is no getting the hook out of their mouth, or throat, as the case may be. The "beckett" is therefore cut, and the conger slips into the bottom of the boat, to die at his leisure. The conger "often gorges the hook," and it gets fast a long way down from his mouth. When the fisherman arrives on shore he has a summary way of getting it out; he takes hold of the "beckett," and smacks the conger as you would smack a hunting-whip; the hook soon straightens and comes out; a tap with a hammer makes it fit for service again.

One of the fishermen, George Smith, caught a "whacker" last year. When he hauled the line he thought "he had got hold of a wreck," but he managed to pull him up gently to the side of the boat, and whip the "heaf" into him. He "kicked up Mag's diversion" in the boat, and nearly got out again; so Smith tied him by the "beckett" to the thwart of the boat with a new French whiting line, which Master Conger broke three times. Smith himself, who is a very powerful man, tried afterwards to break the same whiting line, but

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could not. This conger measured eight feet within an inch, and was twenty-six inches in girth at his fins. He was sent off to London directly in a "kitten," or fish-hamper, all to himself. I myself measured a conger on the beach twenty-four inches girth and five feet seven inches long. I had no time or means of weighing him, which I regret. He had two soles and a flounder inside him. Congers are "the daintiest fish out. They won't look at a bait that is the least tainted; only lobsters and bass eat stinking fish." The surest way to catch them is to "trawl for the bait (small flounders, dabs, plaice, etc.) as you go along to the Ness." On these expeditions the boat must be out all night, shooting the lines at sundown, and hauling them at sunrise, or as soon after as the tide will serve.

One day a French fishing-boat came into Folkestone from Portelle, near Boulogne, the weather being too rough for them; they had a few small congers on board, and I observed that they had been baiting their "snoods" with the arms of cuttle-fish cut into bits. They called all Englishmen "John," and when I went to talk to them a red-nightcapped fellow held up a dogfish, and said in broken English, "Vil you buy a dog, John?" I did not buy the dog, but I got a conger's head for threepence, and was told by Mr. Warman, the fishmonger, soon afterwards, that I was liable to 50*l.* for buying in the harbour fish of a Frenchman. The Frenchmen turned out of their boats in the afternoon, and boiled the conger's body on the

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beach, putting sundry odd scraps of fish into their pot as well. As a bystander said, "There's very little fish as them chaps heaves away; they eats a'most anything."

There is another more curious way of fishing than by the long lines, at present practised by not a few persons. What does the reader think of an iron hammer as a bait? To lay the foundation of some new works in the island of Alderney divers are employed; these men, enclosed in their india-rubber armour, see strange sights at the bottom of the ocean. The fish, and no wonder either, at first are alarmed at the unwonted apparition, with its huge glass goggle eyes; but, soon recovering confidence, approach to satisfy themselves of the real nature of the intruder. The monster raises his hammer which he has brought with him to quarry the rocks; the curious fish come up and inspect it; while doing so, they receive a sudden knock on the head which stuns them; and, when they recover their senses, they find a bit of string through their gills, and themselves prisoners tied fast to the india-rubber monster.

On one occasion, a diver had a fight under water with one of the rightful inhabitants of the rocks, which he was so unceremoniously breaking up. A huge conger eel suddenly started from his favourite hole, and furiously attacked the destroyer of his home. A short but severe combat, between the eel and the man, ensued; but a well-directed blow of the hammer soon settled the question against the eel.

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There is at Folkestone harbour a long flight of stone steps, which in the warm summer days becomes a sort of fishermen's club, where, when work is over, they meet and discuss the affairs of the harbour. Close by these stairs I espied, half buried in the ground, a gigantic bone, which these men told me was a whale's "rump-bone." Upon examination it turned out to be, not what they described, but the back part of the head of a large whale. It was dug out of the "lug sand" (the sand where the lug-worm is found), when they were building the pier. Though much knocked about, I could distinguish in this bone the brain cavity and the holes for the exit of the nerves, some of which must have been as large as a man's thumb. This was not the head of a fossil whale, but of some whale that had probably died out at sea, been washed ashore, and buried in the mud. None of the fishermen knew anything of its history; it might have been one hundred or five hundred years old, but it was not a fossil in the true acceptation of the term.

It is not such a very long time ago that whales (the true or "right" whale) were common in the English Channel: in the time of Edward the Third, A.D. 1312-27, they were frequently seen and captured; and every now and then, even in the present day, they appear off our coasts.

In olden times a curious law existed, that when a whale was taken on the British coast it should be divided between the king and the queen, the head only being the king's property, and the tail the

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queen's; the reason for this distinction being, as assigned by our ancient records, "to furnish the queen's wardrobe with whalebone."

I never saw a whale alive; but they have been seen alive near Folkestone, and I heard several stories about them from the fishermen.

Some twelve years ago a whale appeared off Hythe. The inhabitants turned out and attacked him with guns, scythes, and all sorts of weapons; they seriously wounded him, but did not kill him. He was afterwards found floating dead out at sea, and towed into Folkestone harbour. They sunk a barge under him, and, as the tide went down, allowed him to sink into the barge. The barge, whale and all, with his tail hanging over, was afterwards towed to London by a steamer, and was sold for 40*l.* for oil.

Once upon a time, as Mr. Smith, one of the most experienced of the Folkestone fishermen, tells me, a large whale appeared off Weymouth, and was seen by several fishermen. The affair was talked over at night in the public-houses, and one of the company, who happened to have a new seine-net which he had never used, was much taunted about it, and he was dared to go and net *this* whale with his new net. At first he took it as a joke, but, under the influence of beer and the chaff of his comrades, he stamped his hand on the table and said, "Well, if I don't go and shoot the net after him, catch or no catch." Accordingly a sentry was posted, and the next morning the whale was signalled as being in the offing. So the owner of

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the new seine put it into the boat, and, rowing quietly along, shot the net round the unsuspecting whale. At last Master Whale put his nose into the net, and feeling something strange, charged against it, dragging men, boats, and all along with him. He then plunged and dived, ultimately taking the new seine-net, rolled about his body, right away with him, in spite of all the fishermen could do. They looked after the whale, who had gone off with the net, much as an angler looks into the water when a fine fish has escaped from his hook; but, however, the whale was gone, and the would-be captors rowed home disconsolate and whaleless.

Some three or four days afterwards, as a coast-guard was going his rounds in the dead of the night, he saw a huge black mass come rolling in with the tide; it looked like a wreck, yet it was not a wreck, for a wreck has not a tail wherewith to flop the water as the object had. The coastguardsman waited till the tide turned, and as it went down he got near to this strange object, which had got hard and fast among the rocks. He saw that it was a whale, and, what was exceeding strange, the whale had a net entangled round about him in the most complicated manner. "First come, first served," said the coastguardsman to himself, as he pulled out his knife and cut two great slashes in the whale's fat sides, during which operation (mark it, O reader), the *whale kicked and evinced signs of life*. The finder then shut up his knife and posted off with the news. Of course, as there was a net

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round the whale, his identity was established directly, and the owner of the net claimed the carcass because his net had caught him; the coast-guardsmen claimed it because he had found him. Meanwhile, when the dispute was still going on, the lord of the manor put in his claim, as it was found between high and low water-mark, gained it, and took possession of the whale, cut him up and boiled all the oil out of him, getting forty barrels, worth a lot of money; and there the matter ended.

Some weeks afterwards, as the coastguard was sitting on his "donkey" (the term applied to the portable stool used by these men), a respectable-looking gentleman walked up to him, and said, "My man, don't you recollect the whale that you found herabouts some time since?" "Yes, sir," said the man, "it was me as found him." "Well, now, can't you recollect whether, when you cut him (as they tell me you did), he kicked and winced under the knife?" "In course he did!" was the answer; "he nearly knocked the knife out of my hand with his tail." "Well, then," said the old gentleman, bristling up all of a sudden, "now, I am a lawyer, and mind that you tell the same story to-morrow, sir; for, as sure as to-morrow comes, you will have to *swear* that in court." On the morrow the coastguardsman swore that the whale was alive when first he saw him on shore, and that he knew it by the knife test, as stated above. It was now the lord of the manor's turn to sing small, for he could not claim a thing if cast up *alive*. He

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had to refund the money he got for the oil, having taken all his trouble for nothing; so that, after all, the owner of the new seine caught his whale, got his new net back, and nearly a hundred pounds besides.

THE END

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